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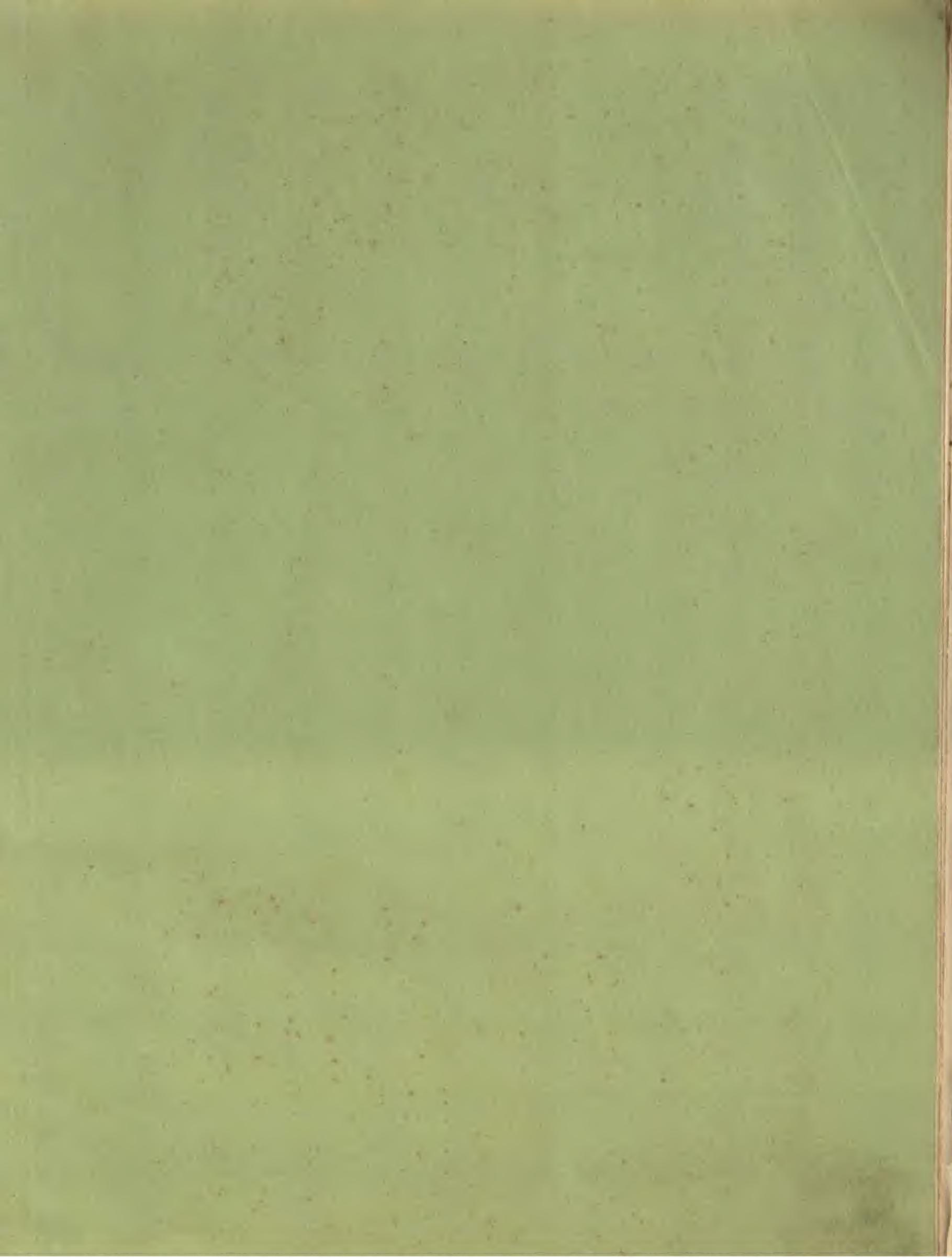
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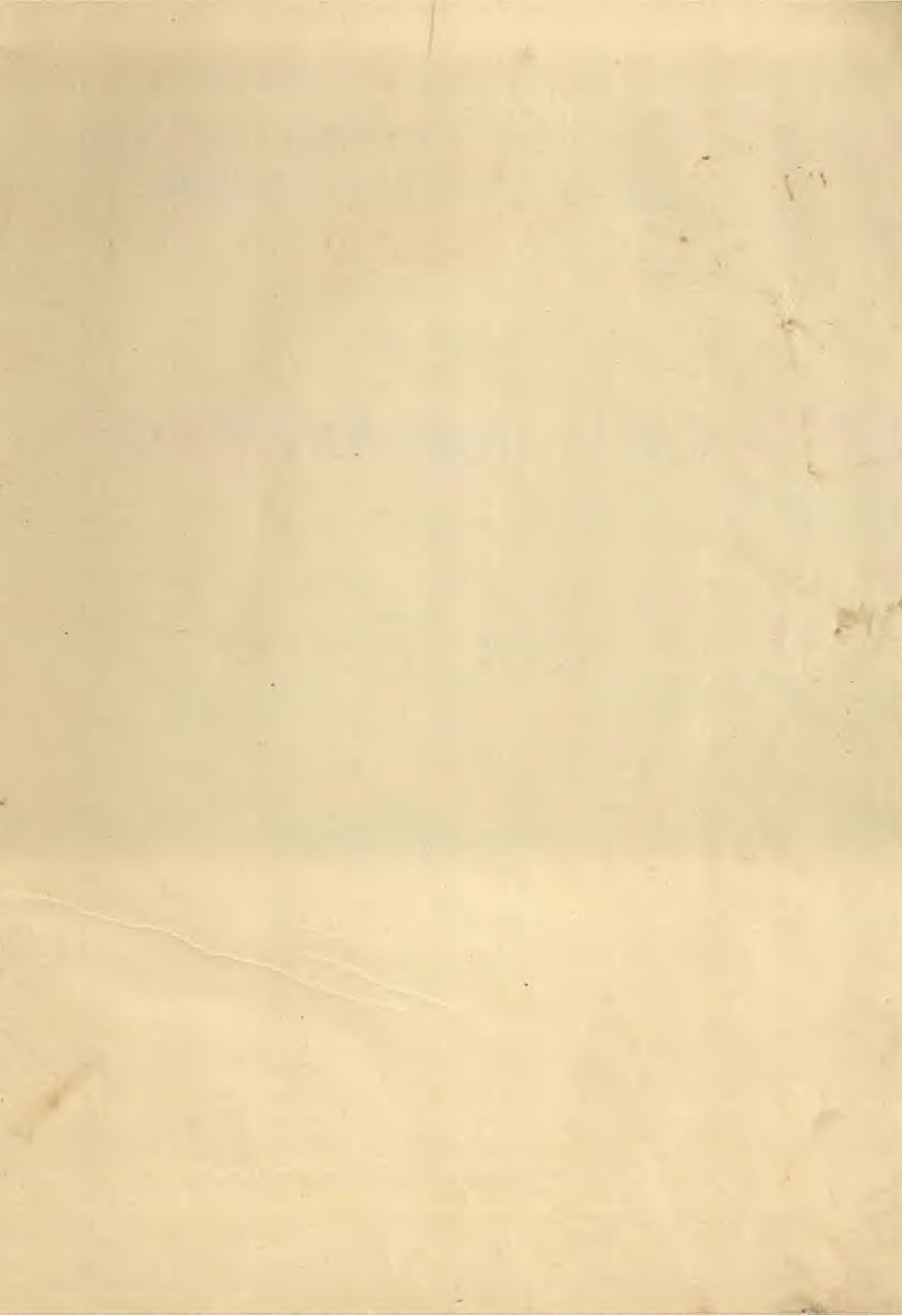
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THE BEADS FROM TAXILA

BY

HORACE C. BECK, F.S.A.

EDITED BY

SIR JOHN MARSHALL, C.I.E., LITT.D., F.S.A.,
Fellow of the British Academy, and Correspondent de l' Institut de France

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An Examination of about 950 Selected Beads, dating from c.700 B.C.
to c.500 A.D., exhumed from the excavations at the site of Taxila
during the years 1912-1934.

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BEADS FROM TAXILA

INTRODUCTION

The beads from Taxila are of great interest. The large number of materials employed and the varieties of form are in themselves well worth studying, but what makes them of particular importance is that we find among them typical European beads from settlements dating as far back as the fifth century B.C. or thereabouts. This shows that European beads were reaching India before the time of Alexander, and is another proof of the trade connections which must then have existed between Europe and Asia. In many cases, as might be expected, the dates of the Taxila beads can be given in approximate figures only. This remark applies particularly to the specimens emanating from the lower strata in the Bhir Mound, where the age of the settlements prior to the fourth century B.C. can only be roughly estimated on the basis of stratification and the probabilities of the case; and it applies, also, to the specimens from such sites as Jandīl and Jauliāñ, etc., where the *terminus a quo* can be fixed within narrow limits, but not the *terminus ante quem*. On the other hand, we are on quite secure ground as regards the date of beads found in certain relic caskets at the Dharmarājikā Stūpa and other sites. Thus, one such casket dating from the middle of the first century B.C., contained 71 beads, and another, dating from the first half of the same century B.C., contained 25. It is to be noted, however, that the large amount of wear on some of the beads from these two groups suggests that they were already old and valued at the date they were buried. The same inference, let me add, is suggested by the condition of some of the beads from South India, where very worn specimens are found buried in some of the megalithic tombs.

In my examination of the selected beads sent to me by Sir John Marshall, of which there are about 950, and also of a series of beads from Taxila now in the Cambridge Museum of Archaeology and Ethnology, I have found about half a dozen which appear to belong to an altogether earlier civilization. The beads referred to are two glazed quartz beads (Pl. V, Nos. 1 and 2), a carnelian bead (Pl. IV, No. 33), an eye bead (Pl. II, No. 34), a lion amulet of lapis lazuli (Pl. VII, No. 4), and two etched carnelians at Cambridge (Pl. II, Nos. 30 and 31). There are also a few others to be mentioned later, but they are not so striking.

With a collection of selected beads such as these it is impossible to say whether any given specimen is a rare or common type; but when there are a number of one type it is inferred that the type represented is a common one.

In the description of the plates, against each serial number are given the material and name of the bead, as well as the site, the reference number of the bead in my classification, and the probable date as supplied by Sir John Marshall. In order to explain these numbers and the nomenclature of the shapes of beads referred to in the text, copies of Pl. I, and of the double Pls. II, III, from my paper

on 'Nomenclature and Classification' have been added as Pls. XI and XII. Pl. XI shows the Regular Groups which are arranged according to their transverse section, and Pl. XII shows the division of a group into families and classes according to their longitudinal sections. These explain the Regular Groups of Sub-divisions I and II (Groups I to XVI). A list of the Special Groups, Sub-divisions III and IV (Groups XVII to L) is given at the end of the description of the Plates.¹

In describing a series of beads like these it is not easy to decide on the most convenient way of arranging them. In this article I have grouped together the beads made of similar materials, but I have made an exception in regard to the amulets representing animals, birds, etc., which I have grouped together. This enables one to see, side by side, the amulets representing the same animal, although they may be of different materials.

In the case of the selected glass objects I have considered, first, the various samples of glass (not beads) from different sites, then the beads from the Bhir Mound, next those from Sirkap, and, lastly, those from other sites.

ETCHED CARNELIANS AND AGATES

A curious technique in bead manufacture is shown in the etched carnelians and agates illustrated in Pl. I, Nos. 1 to 7, and Pl. II, Nos. 1 to 31. In these beads the pattern is put on artificially by applying a strong alkali and then heating. This method has been described by Mr. Mackay in the *Journal of the Royal Asiatic Society* (October, 1925, pp. 697-701), and although some doubt has been thrown on some of the details, beads similar to many of those illustrated can be made in that way.²

There are three varieties of technique used. By far the commonest is the method of putting the pattern as white lines on a red or black background. In this case the actual change in the material due to the addition of the alkali is so great that in a few cases, due to the unequal expansion, the white portion has flaked away, leaving grooves. This has led to the erroneous belief that the bead has been cut away and the white portion inlaid. Beads which have been produced by this technique, which I call the first process, have been made in India during many periods³ and may be made there still; certainly, very perfect and elaborate specimens

¹ For further particulars see "Classification and Nomenclature of Beads and Pendants" by Horace C. Beck, *Archæologia*, Vol. 77, also reprinted separately. Copies of this and other reprints can be obtained from H. C. Beck, Coates Farm, Fittleworth, Sussex.

² The process as practised at Sehwān in Sind until a generation ago, is described by the late Mr. N. G. Majumdar as follows:

"Put half a *rahatak* of washing soda in 2 *tolas* of water, and allow it to dissolve in a cup. Take some soft twigs of *kirur* (=*capparis aphylla*, a bush which grows wild in Sind and South-western Punjab), and rub pieces of them in the liquid, bringing the liquid to the required consistency and refining it through a piece of linen. Mix cotton wool with potters' clay and pound it in an iron or pottery vessel so as to make it soft like wax. Prepare a mould of this clay and put the carnelian to be decorated in it, leaving the face to be decorated exposed. Dry it in the sun. Then draw or write whatever is desired on the carnelian with a reed or steel pen, using the aforesaid liquid. Let it dry in the air. Then fire it between two layers of charcoal. Keep the mould under a lid for cooling. Then take out the carnelian from the mould and clean the soot from its body. The decoration by this time has become milky white, and is permanently etched on the carnelian."—[J. M.]

³ For etched carnelian beads of the Chalcolithic Period at Mohenjo-daro, see Marshall, *Mohenjo-daro and the Indus Civilization*, pp. 509, 515-16, 583; H. C. Beck, "Etched Carnelian Beads" *J. S. A.*, Vol. xiii, 4 (1933).

have been made in Persia during the last fifty years. At Kish and Ur in Mesopotamia they are found from before 3000 B.C. At the former place they have only been discovered amongst the remains of the early period, but at Ur a specimen dated between 800 and 600 B.C. has been found. Numerous examples also come from Syria and Russia. Most of these it is difficult to date, but some of the Russian specimens are as early as 300 B.C., whilst others are as recent as 1300 A.D.

In the second process the pattern is made in black on a white ground. The method seems to be to whiten the whole surface with alkali, which is done to a great depth, sometimes through the whole thickness of the bead, and then by some process not at present known, to etch or paint a black line which only goes a few thousandths of an inch into the surface. Beads of this second process, although very much less common than those of the first process, have been found in various countries. The earliest comes from Ur, and although not definitely dated, was classed as belonging to the early period. A considerable number come from Syria and are undated, but I do not think they are much more recent than the Christian Era. One of the specimens from Taxila dates from the first century A.D.; the other is undated. I have found no evidence that this process has been carried out recently.

The third process, which I have only seen in one specimen, has a black line direct on the red surface of the carnelian. This specimen, which is dated to the first century A.D., comes from Taxila and is figured on Pl. I, No. 1.

In addition, a certain number of beads, both carnelian and agate, appear to have been treated with alkali over part or the whole of the surface without any attempt at making a pattern.

The beads of the first process found at Taxila bear no resemblance to the tabular beads with dots all round found so frequently in the megalithic tombs and middens in Southern India. This is rather surprising, as some of the glass and quartz beads show great resemblance. The earliest beads of this process from Kish and Ur are of tabular form with a heavy line round the surface near the edge, or in some cases U-shaped markings, also near the edge. There are no beads of that type among the selected specimens from Taxila, but amongst the beads which are said to have come from Taxila, in the Ridgeway collection now in the University Museum of Archaeology and Ethnology at Cambridge, there are two beads of this type. The other etched beads in the same collection from Taxila exactly resemble some of those sent to me to report on, and I wonder whether these two beads (Pl. II, Nos. 30, 31) can have come from an early site at or near Taxila. What makes me think this likely is that, as mentioned before, one or two of the other beads from Taxila show great similarity to early Mesopotamian beads.¹

With the exception of these two beads of doubtful age, the etched beads from Taxila are spread over a period of some seven centuries, from the fifth century

¹ The beads referred to at Cambridge were purchased by me from local dealers some thirty years ago and presented to Sir William Ridgeway. Most of them had no doubt been obtained at Taxila, but the two beads in question may well have come from some older site.—[J.M.]

B.C. to the second century A.D. Of the specimens illustrated, those shown in Pl. I, No. 5, and Pl. II, Nos. 1 to 16, are from the Bhir Mound; those on Pl. I, Nos. 1, 2, 3, 4 and 6, and on Pl. II, Nos. 17 to 27, are from Sirkap; beads from Jandial are on Pl. I, No. 7, and Pl. II, No. 28, and a bead from the Dharmarājikā Stūpa is figured on Pl. II, No. 29.

All the beads from the Bhir Mound have been made by the first process. Nos. 1 to 3 and 5 and 6, Pl. II, are agate; Nos. 4 and 7 to 16 are carnelian. The carnelian varies very much in colour, some beads being almost as pale as chalcedony, whilst others are very dark.

A not infrequent form is a spherical bead with plain spots upon it. Two are from the Bhir Mound (Pl. II, Nos. 5, 16) and dated in the third century B.C.; a similar one from Sirkap (Pl. II, No. 26) is dated in the first century A.D.; whilst the only etched bead sent from the Dharmarājikā Stūpa is of this pattern and is referable to the second century A.D. or later.

Another simple device frequently used is one or more bands or "zones" etched round spherical or barrel beads (Pl. II, Nos. 3, 4, 12); these go back to the third to the fifth century B.C. If three parallel zones are etched round a spherical bead and the perforation is put through the middle zone, the bead becomes an "eye-bead" (Pl. II, Nos. 2, 19); those illustrated date from the third century B.C. and first century A.D., respectively. A more usual way of producing an "eye-bead" is by etching a series of rings, and sometimes adding a dot in the centre (Pl. II, Nos. 8, 24).

A design, common at Taxila but which I have not seen elsewhere, is made by etching a series of pentagons round a spherical or barrel bead. In the former case it virtually forms a dodecahedron, whilst in the latter case a zone band is usually etched at each end (Pl. II, Nos. 1, 7, 17, 18). The first two date from the third century B.C., the last two from the first century A.D.

A plain wave or chevron pattern is etched on a fifth century B.C. bead from the Bhir Mound (Pl. II, No. 10), and a similar pattern on a bead of the first century A.D. from Sirkap (Pl. II, No. 23); whilst a more elaborate pattern of a chevron combined with zones and spots (Pl. II, No. 9) comes from the Bhir Mound and is referable to the third century B.C.

Two beads from the same site, dated in the fourth century B.C., are interesting, as they represent double axes (Pl. II, Nos. 14, 15).

A broken specimen has triangles etched on it (Pl. II, No. 13), whilst a small tabular bead (Pl. II, No. 11) has a square on each side. The best specimen of a tabular bead, however, is the cross bead (Pl. I, No. 5) which has on each side the device of a cross inside two squares; it dates from the third century B.C.

Amongst the beads from Sirkap, in addition to those already mentioned, are several of considerable interest. A striped bead (Pl. II, No. 21) has six short longitudinal lines etched along it, and appears to be a copy of a glass bead like these found in Europe in the third century A.D. A similar glass bead, but with red stripes, is shown on Pl. I, No. 26.

Another bead—an agate barrel—(Pl. II, No. 20) has the pattern put on in a very indefinite manner and only slight discolouration has taken place, which

suggests some alteration in the technique. The spherical bead (Pl. I, No. 6) has two different shades of etching, the lines going round as zones being much whiter than the small lines crossing the central zoneband at an angle.

A large zone bead of peculiar colour (Pl. I, No. 3) is extremely like the etched zone beads now found in Tibet, though some of the latter are three times the size of the Taxila specimen. The date of the Tibetan specimens is not known, but they have considerable value locally. The Taxila specimen dates from the first century A.D.

The beads from Sirkap, in addition to the bead made by the third process, also include two, both of the first century A.D., made by the second process. One of these is a spherical bead with whitened surface and a number of black spots (Pl. II, No. 27), the other is a chevron bead in which the black is very intense and almost looks like an enamel (Pl. I, No. 2).

The only other etched bead that needs to be mentioned is a fragment from Jandial (Pl. I, No. 7). This appears to be made by a variation of the second process. The material has been whitened right through to the perforation and then, instead of a black, a pale brown colouring matter seems to have been used, and the greater part of the surface has been coloured with it. This specimen is unfortunately not susceptible of being dated.

Amongst the carnelian and agate beads are a certain number which, although they have no regular pattern on them, appear to have been treated with an alkali. The button from the Bhir Mound (Pl. II, No. 32) seems to have been treated in this way; other specimens have only a portion of the surface turned white. In some cases, as with the collared barrel bead (Pl. II, No. 33) the whitening of the surface is accompanied by a number of flaws and may be the result of accidental burning.

This partial discolouration may possibly be due to the bead having been buried in very alkaline earth for a long period, but this hardly seems probable, since many very early beads show no signs of discolouration. A chemical test of such beads discloses a great deal of soda in the surface of the bead.

CEMENTED EYE BEADS

A very unusual series of beads are the compound stone and shell eye beads illustrated on Pl. I, No. 8, and Pl. II, Nos. 34 to 45.

The making of eye beads out of stone for protection against various forms of evil dates back to a remote antiquity. One of the simplest and earliest kinds is cut out of onyx. Such beads, called "cameo eyebeads", were made in Mesopotamia and Persia from before three thousand B.C.; very similar ones are still being made in the latter country and worn as charms against smallpox.

The earliest beads of this type are usually single but sometimes double. The finest specimen known is the double bead cut from three layers of onyx, now in the Ashmolean Museum. It has twice been dedicated to Ningal, first by Abieshu about 2000 B.C. and later by Sennacherib about 700 B.C. Single eye-beads of the later period are fairly common. Whether it was on account of the lack of

suitable stones or for the purpose of getting a greater variety of colour, such beads were sometimes made by sticking two stones together, that is, by cementing a coloured centre piece onto a white background. Specimens have been found both at Ur and Nineveh; in the former, a green centre has been added; in the latter, a centre of dark brown obsidian. Unfortunately, neither of these specimens are dated.

In the foundation deposit of the temple of Chouchinat at Susa an eye-bead of the ordinary cameo type was found, and with it a chalcedony backplate for a cemented eye, in which the centre has been ground away to insert the pupil. This backplate, which is illustrated in *Délégation en Perse Memoirs*, Vol. VII, Pl. XIII, is identical with the bead from the Bhir Mound shown in Pl. II, No. 34. The Persian bead dates from about 2500 B.C. I do not know if there is any possibility of the Taxila bead being of the same date (according to the place where it was found it has been dated about 400 B.C.); if not, we must regard it as a curious case of identically the same kind of bead being reinvented. Another possible explanation would be that the type was continued from the early period down to the later one, but there is no evidence of that at present.¹ Whether or not this bead with the hollow is earlier or contemporary with the other Taxila beads, it is certain that the method of making cemented "eye beads" was developed there in a manner that has not yet been met with elsewhere.

The simplest, though not quite the earliest, specimen, referable to the third century B.C., consists of a barrel bead of shell which has had two large flats ground on it and pieces of quartz cemented on (Pl. II, No. 35). The quartz is colourless.

The other cemented eye-beads have, or have had, a larger number of patches cemented on. Eight are from the Bhir Mound and three are from Sirkap. All have a white base, except one of black agate (Pl. II, No. 36). This bead had six patches of chalcedony cemented on to it. Four of these still remain, and, like all the other patches that have survived, they are of such a shape that they must have been ground up and polished separately before being cemented on. The agate is spherical and the ground surfaces on which the patches are cemented are so arranged that, if continued until they meet, they would form a cube. A similar bead in which the surfaces have been ground larger is shown in Pl. II, No. 37. This has a white base but all the patches are missing; both these specimens are dated in the third century B.C.

The most complete specimen is shown in Pl. I, No. 8. This has a white base, and has been so ground that if the surfaces were continued they would make a dodecahedron. Eight of the patches remain; they are made of a very brilliant carnelian. This bead is of the same date as the previous ones. Similar beads on Pl. II are No. 38 from the Bhir Mound, also of the same date; No. 40 from the Bhir Mound, but dating from the fourth century B.C.; and No. 44 from Sirkap, dating from the first century A.D. The two last have no patches remaining but several surfaces show signs of cement.

¹ A somewhat similar bead with an artificial material filling the central depression, has been found at Ur in the 1930-31 Season. This is probably of an intermediate date.

Another form is a barrel with flats ground at each end; in one case these are so arranged that if continued they would make a twisted square (Pl. II, No. 39). This specimen dates from the fourth century B.C.; another specimen dates from the first century A.D. and is similar, except that it has six flats meeting at each end.

Besides the foregoing, there are three much more elaborate beads (Pl. II, Nos. 41, 42, 43), which one would not have taken as cemented beads, were it not that one of them still has a patch cemented on to it, and the other surfaces show signs of cement. No. 41 has four octagons and four squares round the perimeter, whilst No. 42 has six octagons, and No. 43 six hexagons. There is nothing to indicate whether patches were cemented onto all or only some of the surfaces. No. 41 dates from the third century B.C.; Nos. 42 and 43 from the first century A.D.

AGATE BEADS

(Plate I, Nos. 10, 11, 12, 30. Plate III, Nos. 1 to 41.)

Agate is a variety of quartz, and, except for colour, is practically the same as carnelian and chalcedony. Black and bluish-white agate is frequently called nicolo.

In addition to the etched agate bead already described there are a great number of agate beads and pendants which have not been chemically treated. In fact, agate beads seem peculiarly characteristic of this civilization. Of the 933 beads sent for examination, 179 were of agate; the only material of which more were sent was glass, of which there were 196 specimens; but if one adds to the number of agate beads those made of carnelian and chalcedony, which are practically forms of agate, one gets a total of over 300 or about one-third of the total number of beads selected.

Most of the agate used is black or dark brown with white or red, but various shades of grey and other colours are found.

The beads illustrated on Pl. I, Nos. 10, 11 and 30, and Pl. III, Nos. 1 to 27, are from the Bhir Mound. Those on Pl. III, Nos. 28 to 32, are from Sirkap; Pl. I, No. 12, and Pl. III, Nos. 33 to 37, from the Dharmarājikā Stūpa; Pl. III, Nos. 38, 39 and 41, from Jāndiāl, and Pl. III, No. 40, from Mohrā Morādu.

One type of bead, of which there are several specimens illustrated (Pl. III, Nos. 1 to 6 and No. 37), and which is specially connected with India, is the flattened leech bead. These beads, though somewhat flatter, are not unlike the leech beads made of glass, ivory, amber, etc., mounted on fibulæ in Europe during the eighth to sixth centuries B.C.; and it is this resemblance which accounts for their name. At Taxila they appear to extend over a considerable period of time. No. 1 is from one of the earliest sites and dates from about the sixth century B.C., No. 2 from about the fourth century B.C., Nos. 3, 4, 5 and 6 from the third century B.C., and No. 37 from the middle of the first century B.C. Similar beads in agate, limestone, and faience have recently been found at Ur.

The three pyramid pendants (Pl. III, Nos. 7, 8, 9) are typical of several sent. The first has a square section, the next a rectangular one, and the last a triangular one. These three all come from the Bhir Mound and are referable to the third century B.C. Pendants of this type are rarely met with in Europe, although one, with a square section, but a rather more pointed top, has been found in Crete and belongs to about the eighth century B.C. A somewhat similar pendant comes from Sirkap (Pl. III, No. 28) but this, although in shape it suggests some of the Persian seals of the Achaemenian period, is really more recent, being dated in the first century A.D.

Amongst the agate specimens are a number of other pendants, several of which are of forms not met with outside India, namely, the pendant with square section (Pl. III, No. 9), the dagger pendant (Pl. III, No. 10), and the drop pendants with circular section and flat polished top (Pl. III, Nos. 11, 12). Some Mesopotamian pendants are somewhat similar, but the ends are usually left quite rough. If the suggested dates are correct, these pendants extended over a considerable period. Of the agate ones illustrated, the larger dates from the fifth century B.C., the smaller from the fourth century B.C. Some similar specimens, also from the Bhir Mound, are supposed to be of the third century B.C., whilst the granite specimen from Sirkap (Pl. VI, No. 26) dates from the first century A.D.

Another interesting pendant, also referable to the third century B.C., is the ball pendant (Pl. III, No. 14). I do not know any other pendant quite like this, but it has a slight resemblance to some of the amber and silver pendants made in Italy about the seventh century B.C. The similarity, however, is not sufficiently close to suggest an actual connection.

Another very curious feature of the Indian beads is that so many of the regular forms are flattened, the circular section becoming elliptical, and the regular hexagon section becoming an irregular one with two sides much greater than the others. This was done to a considerable extent in Mesopotamia, but rarely to such an exaggerated degree as at Taxila. Two extreme specimens are the elliptical ellipsoid (Pl. III, No. 15) and the flattened hexagonal bicone (Pl. III, No. 20). These are both from the Bhir Mound; No. 15 is dated in the fifth century B.C. and No. 20 in the third century B.C. The later beads from Sirkap are not flattened to so great an extent.

Great care has been taken in cutting many of the stones so as to get special effects from the natural structure of the stone, white or coloured bands being arranged to form "eyes", "zones" or chevrons, all of which may have had special meanings. From the careful way in which the colours are selected it may be supposed that they had talismanic properties, as they had in Mesopotamia.

Several eye-beads made in this way are shown on Pls. I and III. One from the Bhir Mound (Pl. I, No. 10) is referable to the fifth century B.C., as are also two others from the same site (Pl. III, Nos. 24, 26). No. 25 is from this site but dates from the third century B.C. Two similar beads come from the Dharmarājikā Stūpa (Pl. I, No. 12 and Pl. III, No. 33). The former is a beautifully coloured specimen dating from the first century B.C., whilst the latter, in brown and white, is of the same date. Beads with somewhat similar effects are Pl. III, No. 17,

of the third century B.C., and No. 38 from Jāndiāl, which must be later than the first century B.C. The Zone effect is seen in beads Nos. 15, 16, 20 and 34, whilst Nos. 39 and 40 show chevrons. A typical form of barrel bead with irregular markings is shown in Pl. I, No. 30.

A practice which is illustrated by beads from several Indian sites, is to cut a groove or zone near the end of long barrel beads, which gives somewhat the effect of collars. This is clearly shown in Pl. III, Nos. 18 and 22.

An unusual form of the regular faceted beads is the tetrahedron perforated through the middle of two of the opposite edges (No. 27). This seems to have been confined to India, so far as our present knowledge goes, but to have been made of different materials and at various dates. The cornerless cube, one of the commonest forms of faceted beads, is found here in three rather unusual varieties. No. 30 is the usual shape, but has collars at each end; No. 32 is, rectangular, not square in cross section; and No. 38 is only slightly chamfered at the corners, so as to leave the surface octagonal. Another semi-regular figure frequently found in many countries is the double hexagon (No. 28).

Amongst the other agate beads illustrated on Pl. III are: a toggle bead (No. 35), a truncated pyramid bead (No. 30), which is an eastern type, a cross bead (No. 22), not unlike some of the beads found in Europe, and a bead (No. 19) said to represent the "*nandipada*" or footprint of the sacred bull, which is an entirely Indian device.

CARNELIAN

Carnelian is really a red agate. 109 Carnelian beads were selected for examination. 21 of these have already been described with reference to the etching process. 43 are illustrated on Pl. IV and 6 on Pl. VII.

Beads Nos. 1 to 21 on Pl. IV are from the Bhir Mound; Nos. 22 to 34 are from Sirkap; Nos. 35 to 38 are from the Dharmarājikā Stūpa; and Nos. 39 to 43 from Jāndiāl.

No. 1 is a typical flattened hexagon cylinder dating from the third century B.C. No. 2, which is one of the earliest beads sent, dates from the seventh or sixth century B.C. Both these beads are typical of the flattened form, which, although occasionally found in the Aegean and rather more frequently in Mesopotamia, is much more common in India. No. 3 is a diamond circular bead; it is a rare form found in Mesopotamia in early periods but not elsewhere. Nos. 4 and 40, the first dating from the third century B.C., are triangular barrels of a form frequently found in Southern India.

No. 5 is a cornerless cube with the usual amount of chamfer, so as to make square surfaces on the sides and ends. This type is one of the commonest of the faceted beads, having been found in practically every country in Europe, Western Asia and Africa, where any systematic collecting of beads has been carried out. This specimen is referable to the fourth century B.C.

Other regular beads are No. 29, a square biconic (first century A.D.), No. 36, a double pentagon (first century B.C.), and No. 39, a special form of double

pentagon, where the surfaces have been rounded so that the triangular surfaces are joined on to the rhomboid ones, making pentagonal surfaces, with the result that the bead nearly becomes a dodecahedron. No. 32 is a very simple but unusual form of bead; it is a cylinder with heavily chamfered ends, dating from the first century A.D.

Some flattened leech beads Nos. 8, 9 and 35, are very similar to some of the agate ones on Pl. III; the first two date from the third, the last from the first century B.C. This last was found in a casket with a number of other beads, amongst them the barrel or lenticular tabular beads, Nos. 37 and 38 on this Plate.

Of pendants, there are several varieties. No. 7 (third century B.C.) is a typical dagger pendant; No. 6 (fifth century B.C.), of rather an indefinite form, appears to be a club pendant, and No. 41 is one of a series of pendants made of different materials which evidently represent a club or truncheon. No. 31 (first century A.D.) is a beautifully made drop pendant; No. 23 (first century A.D.) a double drop pendant, and No. 12 (fifth century B.C.) an inverted drop pendant. The double drop pendant is very similar to a series of pendants found in Egypt, where they are supposed to represent the genitals of the bull.

No. 13 (third century B.C.) is a very curious pendant; it is like the inverted drop pendant (No. 12) but is flat on one side as well as on top. The perforation enters the top and comes out at one side. There is also a spiral groove ground out for two turns round the top. It is too small to have been used as a plumb-bob like the so-called larger pendants of a fairly early period found at Ur, but, except for the groove round the top it resembles them in general shape and method of preparation. No. 19 (third century B.C.) represents an axe of rather an unusual shape.

The pendant, No. 28 (first century A.D.), is a very well made specimen, unfortunately broken through the perforation. It appears to represent a bell, and over a considerable amount of the lower part is a dense white patch with wavy outline, evidently due to some alkali treatment. Another pendant of a type not found in Europe or the Near East is No. 34 (first century A.D.); this is called an inverted flower pendant, and is very well made in spite of its being a difficult shape to fashion in such a hard and brittle material.

The two small pendants Nos. 21 and 22 take the form of *triratnas*, intended to represent the three sacred jewels of the Buddhists—the Buddha, the Dharma and the Saṅgha. The similarity of the two pendants is very striking, but the first dates from the 3rd century B.C. and the second from the first century A.D. Although conservatism in design, particularly when connected with religious objects, is conspicuous in India, it is nevertheless rather startling to find such complete identity after a lapse of some centuries.

Some of the other beads also show great skill in manufacture. The bent bead No. 10 (third century B.C.) is beautifully made, but it is difficult to see for what precise purpose. If, as the angle suggests, it was intended to hang in the middle of a necklace, one would have expected something more showy, like the next bead, No. 11, which is of the same date and has ends at about the same angle. It is difficult to say whether these ends, which are in the form of double collars, represent horns or whether they are purely ornamental.

Another extraordinary bead, and a *tour de force* as far as manufacture is concerned, is the spiral ear-ring, No. 18 (third century B.C.). This is a copy of a helical metal ear-ring of about two turns, separated like a pulled out spring; it is carved out of a solid piece of carnelian.¹

The cross bead, No. 14 (*circa* fourth century B.C.), is also interesting. It has a little convex projection on each arm of the cross and another in the centre. One lobe has unfortunately been broken off.

Another noteworthy pendant is No. 16 (*circa* fourth century B.C.). The upper portion, where presumably the perforation was, is broken away; the rest is decorated around the edge with five crescents in the manner common on early Indian charms.² No. 17 (third century B.C.), of which the point is broken off, is evidently a tooth charm.³ Nos. 15 (*circa* third century B.C.) and 30 (first century A.D.) represent little gadrooned vases; whilst No. 24 (first century A.D.), a rather more roughly made bead, obviously represents some emblem; possibly a double comb.

Another bead of great interest is the imitation cowrie shell No. 26 (first century A.D.). This bead has a great similarity to the flat form snake's head worn as an amulet by the Egyptians during the period from the VI to XII Dynasties.

Among the beads from Taxila are a few which appear to belong to a much earlier period than the sixth century B.C. This has already been pointed out with reference to the etched carnelian and glazed quartz beads. Among them must be counted the irregular carnelian bead with cross hatchings, No. 33, which, although it was found in a stratum of the first century A.D., shows so great a resemblance to some of the very early beads from Mesopotamia that I suspect it of being of the same date. To a less striking degree, the two roughly spherical beads, Nos. 42 and 43, from Jāndiāl, also look like early work. Their outside is spotted with patches of white and covered with conchoidal flaws, and the large concave end shows where it has been broken away, probably during perforation.

GLAZED QUARTZ BEADS.

The beads shown on Pl. V, Nos. 1-7, are made of quartz, which has been either glazed or fire polished.

The glazing of quartz is a process which, in spite of its difficulty, dates back to an extremely early period. So far as we at present know, it was confined to Egypt, Mesopotamia, Syria and India, though traces of it will doubtless be

¹ This is evidently imitated from the Greek spiral ear-ring (Ωτός). This type of ear-ring goes back to the seventh or eighth century B.C. in Greece and extends down to at least the third century B.C. Sometimes it was passed through the lobe of the ear, sometimes suspended from a ring or worn as a pendant to a disk. Cf. *Brit. Mus. Cat. of Jewellery*, pp. XXXIII and Nos. 948 f., 1106, 1583 ff., 1634, 1641-47, 1651, 2114 ff.; Salzmann, *Necr. de Cam.*, Pl. I; Daremburg et Saglio, *op. cit.*, n. v, 'inaures.'—[J. M.]

² For somewhat similar designs on ancient Indian punch-marked and tribal coins, cf. *Brit. Mus. Cat. of the Coins of Anc. India*, pp. XXXV, XXXVIII, XL, XLI, XLII, LXXXVII, XCV, XCVI, XCIX; and compare also the *nan-dipada* device, LXXXVIII, 130-2, and XCI, 144.—[J. M.]

³ For tooth amulets, cf. *Gold and Silver Jewellery, from Taxila* No. 80.—[J. M.]

discovered elsewhere as other countries systematically examine their early history and antiquities.¹

In Egypt the process was used as early as the pre-dynastic period (S. D. 48) and was continued to the XII Dynasty. It is doubtful if it was carried on there at a later date, but certain beads are found which resemble some found in Syria that seem to belong to a very much later period, possibly Roman. Practically all the Egyptian beads have been coloured blue or green, and a large amount of colour usually remains. The colouring matter of all the early specimens is copper.

In Mesopotamia the process of glazing or of fire polishing was practised from an early date. Small shields for inlay were polished by this method about 2300 B.C. Both clear and milky quartz beads were treated in the same way from about that date up to at least 900 B.C. and probably much more recently. In almost all cases the glaze is now quite colourless, but there are a few specimens which show colour over a part and make one wonder if the beads were originally coloured. Persia yields some specimens which suggest an early date; one large bead from there looks mediæval.

The beads from Sirkap and the Dharmarājikā Stūpa are the first beads of this sort that I have seen from India. Like those from Mesopotamia, most of them are colourless; but the little lion (Pl. I, No. 9) has a quantity of glaze which appears to have been blue originally, though now most of it is green and corroded. The remaining beads of this technique come from Sirkap, and in shape so closely resemble other beads from that site, that they are probably of the same date. Several very fine beads of this technique, representing animals, etc., are shown on Pl. VII and referred to later.

In all cases the bead seems to have been heated with soda and left until the surface had fused. It is quite clear on some specimens that the fused material has not flowed all over the bead but has left some portions uncovered. A spectroscopic examination shows that the surface of the bead contains great quantities of soda, whilst the interior of the bead is quite as free from that material as most specimens of natural quartz. These experiments were carried out on beads from Mesopotamia, but I have no doubt that the same results would be obtained if these Taxilan beads were tested in a similar way.

In beads which have evidently been coloured like the cross-hatched specimens (Pl. V, 1 and 2), it is not possible to say with certainty how the colour has been introduced. In some cases, especially with some of the clear blue pendants of the first Intermediate Period from Egypt (about 2500-2000 B.C.), it looks as though the colouring material had been mixed with the soda and then put on the bead, which was subsequently heated sufficiently for the surface to flow, in this way getting the colour very permanently fixed in the quartz. In other cases, as in the lion bead from the Dharmarājikā Stūpa, and in some large Egyptian objects such as a glazed mace head, the coloured glaze flakes away in a manner that suggests that the quartz had been covered with a coloured glaze which had previously been made and then powdered, and that this glaze, although melted

¹ See "Notes on Glazed Stones, Pt. II (Glazed Quartz)" by H. C. Beck in *Ancient Egypt and the East*, June, 1935.

sufficiently to stick on at the time, had never completely incorporated itself with the quartz base of the bead.

This theory does not, however, explain how some of the best glazed specimens have slight traces of colour, and it looks as though, under certain conditions, the colour may fade out of the glazed quartz in the same way as it does from faience.

PLAIN QUARTZ.

Quartz beads have been found at nearly all the Taxila sites and some of these, in addition to the glazed specimens already referred to, are illustrated on Pl. I, No. 29, and Pl. V, Nos. 8 to 29. Some of these beads are of very large size; this is particularly the case with Nos. 28 and 29. The former is an irregular hexagon bicone with one large flat side. It comes from the Dharmarājikā Stūpa, and belongs to the period between the first and fifth centuries A.D. The latter (No. 29) is from Sirkap and is referable to the first century A.D. In this bead the original shape of the quartz crystal has been more or less retained.

From the Bhir Mound there are three beads. The first of these (No. 8) looks as if it might be topaz. A considerable number of such beads are included in this collection, but in all cases they are made not of the true topaz but only of yellow quartz. There are three stones which are very often confused and referred to as topaz. The first is the true topaz, with a hardness of 8, which is one of the few precious stones containing fluorine. It is found in various places both in the Old and New World, including Ceylon,¹ so it would not be surprising if specimens were found here made into beads. The second is the so-called Oriental topaz, which is a form of corundum or yellow sapphire, with a hardness of 9. The third variety, which includes all the specimens sent over, is the false topaz or yellow quartz, or Scotch topaz, which has a hardness of 7.

No. 9 is a plano-convex cylinder of clear quartz and No. 10 a toggle bead of milky quartz. These both date from the third century B.C.

The next six beads on Pl. V. are from the Dharmarājikā Stūpa and belong to the first half or middle of the first century B.C. No. 11 is another specimen made of the "false topaz." It is a very curious shape: a plano-convex bicone, almost a parabola. The next bead, No. 12, is a section cut from a regular crystal, the sides being polished and the ends ground and polished to a slightly convex curve. No. 14 is a very unusual form: it has been obtained by making a cornerless cube and then continuing to grind off the corners until the triangular surfaces

¹ The *Periplus of the Erythraean Sea* (39) mentions *chrysolithos* among the articles imported into Sind, when Indo-Parthian princes were ruling there in the first century A.D.; and Pliny states that this stone, which is usually translated "topaz," came from Aethiopia (Abyssinia), the islands of the Red Sea and India. The Romans, however, appear to have applied the word *chrysolithos* indiscriminately to yellow quartz, yellow corundum, true topaz and perhaps to the modern chrysolite. Schoff in his note on the passage in the *Periplus* (p. 169), says that the *chrysolithos* mentioned in the text "was almost certainly our topaz, which was produced in abundance in the Red Sea islands (*Τοπάζιον νησος*), being an important item in the east-bound exports of Egypt, under the Ptolemies and Rome." This, however, is contradicted by the Author of the article "Topaz" in the Encycl. Britt., who says that the stone from the Red Sea islands was not true topaz but chrysolite or peridot. In Ceylon I was told by the dealers that the true topaz was not found in the island, but came into the local market from the Red Sea. So far as Taxila is concerned, the only *chrysolithos* found by me is yellow quartz (Scotch topaz, or cairngorm).—[J.M.]

became pentagonal. No. 15 is a well made toggle, and No. 16 a small flattened leech bead like the ones made in agate and carnelian.

The quartz beads from Sirkap include two very unusual forms. The button (?) bead, No. 18, which may perhaps represent a shallow pot, is new to me, and so are the two winged beads Nos. 23 and 24, which I call butterfly nut beads. These slightly suggest the neolithic French beads with "ailerons" but they are pierced in the opposite direction. No. 20 is a gadrooned bead in milky quartz. A rather larger variety in clear quartz is not uncommon amongst Greek beads found in Europe.

No. 26 is a very rough and large bead, the surfaces of which obviously follow the shape of the crystal as it was found; and No. 27 is a large hexagonal bicone, which has had a tremendous amount of wear, some of the surfaces being half ground away, apparently from rubbing at the edges.

Another "false topaz" bead is shown on Pl. I, No. 29. It is a hexagonal bicone and comes from the Dharmarājikā Stūpa.

AMETHYST

Beads of amethyst have been found at the Bhir Mound, Sirkap and the Dharmarājikā Stūpa. Some of these are shown on Pl. VI, Nos. 1 to 12; Nos. 1 to 7 are from the Bhir Mound, the first dating from the fifth century B.C., the remainder from the third century B.C. Nos. 8 to 11 are from Sirkap and belong to the first century A.D., and No. 12 from the Dharmarājikā Stūpa, dating from the middle of the first century B.C. These beads are all of quartz amethyst, which is ordinary rock crystal coloured purple, probably with manganese. The oriental amethyst, or corundum form, is not represented amongst the beads sent to me for examination, nor are either of the other corundum forms (ruby and sapphire), although all three are found among the beads from north India which are now in the Cambridge University Museum.¹

The hexagon barrel (No. 2) is very well made and of very good material. The smaller hexagon barrel (No. 3) is flattened like so many of the Taxila beads. The hexagon bead (No. 10) from Sirkap, is flattened in the opposite direction, so that when the bead is strung, instead of having two large surfaces at the sides opposite to each other, there are two small surfaces at the top and bottom which are opposite each other. The short truncated triangular bicone (No. 4), although an unusual form, is also met with in Southern India. The bead No. 11, was intended apparently for a rather rough hexagonal oblate bead, but subsequently broke and was then perforated at right angles to the original hole and so made into a toggle. The small pendant, No. 8, probably represents a vase.

MALACHITE

The three beads on Pl. VI, Nos. 13 to 15, are made of malachite. As this is such a brilliantly coloured material, and relatively easy to make into beads,

¹ These are the beads which I purchased from dealers at Rawalpindi and presented to Sir William Ridgeway.
—[J. M.]

it is surprising that beads made of it should be so rare. With the exception of the six sent from Taxila, the only ancient malachite beads that I know of are various predynastic Egyptian specimens and an Egyptian scarab of the XIX Dynasty. The three beads illustrated are a pear-shaped bead of the first century B.C. (No. 13), the curious shaped bead, possibly representing a vase (No. 14), and a cylinder bead from Lâlechak (No. 15), dating from the fourth or fifth century A.D. The other beads sent but not illustrated, are a small barrel bead and a very corroded carving, possibly meant for a frog, from Sirkap, and an elliptical barrel from the Dharmarâjikâ Stûpa.

LAPIS LAZULI

The 37 lapis lazuli beads sent to me were found distributed over all the sites. Ten of them are illustrated on Pl. VI, Nos. 16 to 25, and two others on Pl. VII (Nos. 4 and 34). The square section cylinder bead No. 16 is better made but otherwise similar to some found at Raigir in Hyderabad by Dr. Hunt. This specimen dates from the fifth century B.C., but the form is not uncommon. Beads of this shape but smaller, have been found at Ur, made of both lapis and shell, and dating from about 2000 B.C.; and similar beads of steatite were made in Egypt at that period. Small glass beads of this shape are very common among Roman remains in England.

No. 17 is a square bicone. This, although a well finished bead, is not quite square in section. Beads of this shape are found in Mesopotamia at an early date. The long hexagon barrel (No. 18) is similar to beads found in other Indian sites, but, for a lapis bead it is unusually well shaped. Many of the lapis beads found on Indian sites are not nearly so well carved as beads of harder materials, such as quartz from the same sites.

The drop or club pendants (Nos. 19 and 25) are very good specimens of this particular type, which seems common at Taxila but rare elsewhere.¹ The former comes from the Bhîr Mound, the latter from Jandîâl.

The beads from Sirkap include the barrel with collars (No. 20) and the convex cone (No. 21), a type which is rare in India, but is found in Mesopotamia made from lapis and other stones, and in the Aegean made from steatite.

The segmented bead (No. 22) is an example of a bead carved in stone apparently copying the ordinary faience segmented beads. The bead No. 23, which is slightly broken at one end may represent a vase. It is the same shape as the malachite bead (No. 14 on this plate) also from Sirkap, and the glass bead (Pl. IX, No. 35) from the Dharmarâjikâ Stûpa.

The only other lapis bead illustrated on this plate is the wedge-shaped oval barrel (No. 24). This bead, although the shape is not anything specially unusual, may be an early bead, as the material appears to be corroding, some sort of disintegration of the surface having taken place. It is from the Dharmarâjikâ Stûpa.

¹ The club type is imitated from Graeco-Roman Jewellery.—[J. M.]

Among the other lapis beads is a small disc bead from Sirsukh, which, from the style of its workmanship, makes me think it may be early; but this is doubtful, as primitive and rough workmanship may be found at any period. There are also several small spheres and barrels, four cornerless cubes, and a small *triratna*, in addition to the lapis lion and beetle (?) illustrated on Pl. VII and referred to later.

GRANITE

This material was rarely used for beads except in Mesopotamia and in Egypt, where it is fairly common in pre-dynastic times and is also found in the XVIII Dynasty. Two beads of black and white granite are shown on Pl. VI, (Nos. 26, 27). The former is one of the typical flat ended pendants dated to the first century A.D.; the latter is a scaraboid and dated to the third century B.C. Both are very well made beads.¹

GARNET

Garnet varies considerably in hardness and specific gravity; it is, however, generally harder than quartz and always has a higher sp. g.

A number of the Taxila beads are made of it. Some specimens from the Bhir Mound, Sirkap and the Dharmarājikā Stūpa, are shown on Pl. VI, Nos. 28 to 34. Others are among the animal amulets on Pl. VII. Some of the beads were only burnished up to irregular shapes, but many were carefully carved, the best being from the Dharmarājikā Stūpa. A spacing bead from the Bhir Mound (No. 28) is well carved and very suggestive of some gold spacing beads from Carthage. The date also is not very different, as the Taxilan specimen dates from the third century B.C. The well cut lenticular spherical bead with collars (No. 29) from the Bhir Mound, is referable to the same century whilst the hexagonal bicone (No. 31) and lozenge (No. 30) from Sirkap, date from the first century A.D.

The beads from the Dharmarājikā Stūpa are the much worn short hexagon barrel (No. 32), the toggle bead (No. 34), and the curious little carving (No. 33) in the form of a *triratna*. These three beads were all found together in a reliquary which dates from the middle of the first century B.C. It is of interest to note that whilst two of these beads show no signs of wear, the hexagon barrel (No. 32) had obviously been very much worn, and probably much valued, before being enclosed in the casket.

JASPER

The remaining six beads on Pl. VI (Nos. 35 to 40) are made of green jasper. This material has practically the same hardness as quartz and is a form of that material probably coloured with iron. Nos. 35 and 36 are long barrels with zones cut near the ends to give the effect of collars, a method frequently employed in Indian beads. These two beads are from the Bhir Mound, and the double hexagon, No. 37, is from the same site.

¹ Granite and gneiss pebbles are very common in the river beds at Taxila.—[J. M.]

The pentagonal bicone, No. 38, shows considerable signs of wear. This bead, and the pentagonal barrel, No. 39 also from Sirkap, are rare forms found on various sites in India, but only very occasionally elsewhere.

No. 40 is a faceted bead of a shape I have not previously seen. It is a form of octagon bead with eighteen square and eight triangular surfaces. It is classed by mineralogists as a semi-regular figure (No. 7 of the Catalan series) and is called an "icohexahedron with square and triangular surfaces." Some of the jasper beads are of the "riband" variety, having veins of haematite running through them.

BEADS REPRESENTING ANIMALS, BIRDS, ETC.

There are a number of beads representing animals, birds, and other forms of animal life. Most, if not all of these, are probably amuletic; so, although they are made of many different materials, I have grouped them all together in one block on Pl. VII.

Only one represents a man (Pl. VII, No. 1) and this one is without the head. It is made of chalcedony and comes from the Bhir Mound.

There is only one bead representing a monkey (Pl. VII, No. 2); it is made of faience and comes from the Dharmarājikā Stūpa, and is a very fine bit of miniature workmanship. It is surprising that an animal so common in India and so mixed up with religious legends should be so rarely portrayed on Indian beads. Monkeys are found on some of the Mesopotamian beads, and the ape is a very common form in Egyptian amulets.

The animal most frequently represented is the lion. It is probable that here, as in other countries, the reason for wearing an image of a lion was amuletic, and that on the one hand it was considered a protection from an attack by a lion and on the other hand it was thought to be a means of receiving some of the lion's strength.¹ Seven specimens of lion beads, all of hard stone, are among the selected specimens; one of them is illustrated on Pl. I (No. 9), the others on Pl. VII (Nos. 3 to 8).

A specimen made of lapis from Sirkap (Pl. VII, No. 4), is very interesting and has a different look to the others. It bears a slight resemblance to some of the pre-dynastic Egyptian carving.

Three of the lion beads are made of glazed quartz (Pl. I, No. 9), and Pl. VII (Nos. 5, 6), as are also the tortoise bead (No. 22) and two frog (?) beads (Nos. 28 and 29). Most of these are from Sirkap, but two of them come from the Dharmarājikā Stūpa.

Quartz is a difficult material to cut and also extremely liable to fracture when heated to a high temperature, so it is very surprising to see so many of these elaborately carved animals made of it. The only specimen which has any considerable amount of colour remaining on it is the lion from the Dharmarājikā Stūpa shown on Pl. I (No. 9). Part of the head of the lion on bead 5 has broken

¹ The popularity of the lion among the Buddhists of Taxila is due to its having been a symbol of the Buddha, the 'Lion of the Śākyā race' (*Śākyasinha*).—[J. M.]

away. Bead No. 3 is well carved in carnelian, and Nos. 7 and 8 are particularly well carved garnets; the latter is also of interest as it shows a running animal; all the others are lying down.

Only one bead of a bull and one of a ram are included in the selected specimens. No goats or other allied animals are represented. The bull bead or pendant (Pl. VII, No. 9) is most peculiar in that, the animal hangs with its head downwards and the perforation passes through a projection where the tail should be. The reason for carving it in this way is not obvious. In amulets from Egypt cows are frequently represented with their legs tied together, but this is to represent the offering for a sacrifice. The bead here is an early specimen from the Bhir Mound, dating from the third century B.C. The ram (No. 10) is from Sirkap and is very well carved.

The only other animal portrayed is the elephant. It is shown on two beads No. 11 from Sirkap, dating from the first century A.D., and No. 12 from Sirsukh, dating from about the third century A.D. The former, in glazed steatite, is amusing on account of the enormous size of the eye, which is made of carnelian and is a very good bit of workmanship.

The curious bead, No. 13, is said to represent a dog's head, but I think it more probable that it was really intended for a fish. It is made in carnelian, comes from Sirkap, and dates from the first century A.D.

There are eight beads representing birds. The most elaborate (No. 14) is made in carnelian, intended apparently to represent a bird in a tree, though it might almost be an early design for a weathercock! It certainly is a very skilful piece of work. The Indian crow (No. 15) is also a very clever production. Unfortunately the tip of the beak and the tip of the tail are broken off. This bead is cut from a black and grey agate (or onyx) and the grey band has been cleverly arranged so as to look like the characteristic belt of grey feathers round the neck of the bird so familiar in the Indian crow. This bead is also from Sirkap and dates from the first century A.D. The white chalcedony duck (No. 16) comes from the Bhir Mound and is referable to about the fifth century B.C. The direction of the perforation indicated by the dotted lines is unusual and must have made it hang awkwardly. The bird amulet in garnet from the Dharmarājikā Stūpa (No. 17) has the head broken off. It may represent a fowl. No. 18, from Sirkap, perhaps represents a cock; this is in bone. The two others, however, from the Dharmarājikā Stūpa, one in shell (No. 19) and one in green glass (No. 20), are so roughly made that it is impossible to say what kind of bird they are meant to represent. They date to the period between the first and fifth century A.D. The same remarks apply to the faience bead from Sirkap, No. 21.¹

There are five amulets of tortoises. Three from Sirkap and two from the Dharmarājikā Stūpa. One from Sirkap is in glazed quartz, the other two in faience, whilst one of those from the other site is of garnet and the other of mother-of-pearl. The garnet one, No. 25, is a beautifully finished specimen dating from the first half of the first century B.C.

¹ The same type of bird with wings outspread occurs among the Copper & Bronze Objects from Taxila.—[J. M.]

The frog, such a favourite amulet in many countries, is represented here by seven examples. No. 27, in banded agate, is broken, and the possible outline of the missing parts is indicated with dotted lines. It is from Sirkap, as is also No. 28, a rather rough specimen in glazed quartz. The next three, one in quartz, one in garnet, and one in amethyst, were all found in the same casket at the Dharmarājikā Stūpa, and date from the middle of the first century B.C. The other two are both in shell, one from the same site as the last three, and the other from Jāndiāl.

The frog seems to have been a symbol of fertility in Egypt (*Amulets*, by Sir W. M. F. Petrie, p. 12) and probably had the same significance in Mesopotamia where frog amulets are very common. Another suggestion as to their power comes from Pliny, who refers to the use of a chilly frog against the chill of fever (Pliny XXXII, 38).

The only other bead of this series is the lapis spacing bead from Jāndiāl (No. 34), which may represent a beetle. Some rather similar beads but more definitely like beetles have been found in Nineveh and in Egypt. This type is so little known that it is difficult to say much as to date, but the beads referred to above as having some resemblance to it are very much earlier than the Christian Era, which is the earliest date suggested by Sir John Marshall for any beads from Jāndiāl.

SHELL

The selected shell beads number 120, some from each of the main sites. 43 of these are illustrated on Pl. VIII. The first ten are from the Bhir Mound, the earliest being the rather non-descript plano-convex barrel (No. 1). It is dated by its findspot to about the seventh-sixth century B.C. The next, dated to the fourth century B.C., is the drop pendant, No. 2. Nos. 3 and 4 are somewhat similar pendants dating from the third century B.C. The square bicone (No. 5) and the barrel with zones cut out near the ends to give the effect of collars (No. 6), are typical Indian forms.

No. 7 in the form of a *triratna*, is very similar to the agate and lapis specimens of that emblem. The next bead, No. 8, is a device which it is difficult to understand. It appears to represent two objects rather like bicone beads interlocked. I have not seen its like elsewhere. The ornamental spacer (No. 9) is provided with holes for five strings.¹ The only other specimen from the Bhir Mound which is illustrated is the cross-bead (No. 10).

The most interesting of the 14 shell beads from Sirkap on Pl. VIII, is the button bead with V perforation (No. 16). Beads exactly like this constitute one of the most typical types of the late neolithic and bronze age in England and France. They are generally made of jet, lignite or shale, but a French specimen has been found made of shell. It is a very curious coincidence that this form should reappear in India some 2,000 years later.²

¹ This was probably used for a hip girdle (*mekhāl*) rather than a necklace.—[J. M.]

² Buttons of terracotta also occur at Taxila.—[J. M.]

There are four spacing beads from this site, the dumbbell (No. 12), the rectangular one (No. 19), and two of a more elaborate shape (Nos. 20 and 21).

Other shell beads worth mentioning from Sirkap are the double drop pendant (No. 18), the imitation cowry (No. 13), the leaf (?) shape pendant (No. 22), and the miniature Corinthian capital (No. 24). The curiously shaped object, No. 23, may have been used as inlay; if not, it looks as though it is part of a compound bead, another piece being held in position by the thread on which it was strung.

Of the ten beads from the Dharmarājikā Stūpa, six are spacing beads. No. 27 is suggestive of the step amulets found in Egypt and at Carthage.¹ No. 28 has a slight resemblance to an animal's head. No. 26 is a double axe, examples of which have been already mentioned amongst the etched carnelians. No. 25 seems to represent a bell, and No. 32 is a toggle.

Amongst shell beads from various localities one occasionally finds some which are absolutely black. It was once thought that these beads were blackened by iron, but this is incorrect, as some of them showed no trace of iron after being tested chemically. Final experiments by heating in the open air produced an intense black identical with that of the Indian specimens. It is more usual to find ostrich egg shells treated in this way, but sea shells also are sometimes blackened, e.g., Nos. 34 and 40.

The beads of shell from other sites at Taxila are, for the most part, not important. Nos. 36 and 37 are shapes frequently found amongst early beads in Mesopotamia. The former is also of interest as it shows marks of long wearing on a thin string, which has worn away a considerable amount at the top of the perforation, tending to make the hole like an inverted keyhole.

In addition to beads cut from shell, in most countries large numbers of complete shells were worn as beads, simply having holes pierced through them. Only three such beads are included in the selected specimens—a fact which suggests that the practice was not common at Taxila. In one find recently made at Nineveh many hundreds, probably thousands, of complete shells were found belonging to fifteen varieties. The three specimens sent from Taxila are illustrated in Pl. VIII, Nos. 41, 42 and 43. The first is *Pusiotoma mendicaria*, L.—a great favourite both in Egypt and Mesopotamia. The second is *Pyrene flava* (Brugniere),² and the third is a fragment of an indeterminate lamellibranch, but it has been ground down so as very largely to lose its shape.

GLASS

Samples of glass from different sites and of different dates³

Glass is one of the most interesting materials used in the manufacture of beads. It is practically the same material as the glaze used in making the substance called in Egypt faience. Glaze appears to be earlier than glass, as glazed stone beads were made in the Badarian period and all through the pre-dynastic

¹ The same 'battlement' design is found in gold beads at Taxila.—[J. M.]

² Kindly identified by Mr. G. C. Robson, of the Zoological Department, British Museum.

³ See "Glass before 1500 B.C.", by H. C. Beck in *Ancient Egypt and the East*, June, 1934. See p. 2, note 1.

and dynastic periods in Egypt. Although there are a few undoubtedly earlier specimens, glass was not common before 1500 B.C. in any of the countries that have been explored.

There is no evidence of any glass at Taxila before the 7th-6th century B.C.

The specimens sent to me for examination (other than beads) are dated approximately as follows:—

5th century B.C.	.	.	.	.	.	.	1 specimen.
4th century B.C.	.	.	.	.	.	.	1 specimen.
3rd century B.C.	.	.	.	.	.	.	3 specimens.
1st century B.C.	.	.	.	.	.	.	1 specimen.
1st century A.D.	.	.	.	.	.	.	20 specimens.
1st-5th century A.D.	.	.	.	.	.	.	2 specimens.

The only specimen of the earliest period is described as a 'cylindrical piece with a floral design.' Unfortunately this has disintegrated in transit, leaving three or four moderate-sized pieces and a great deal that is almost a powder. It is of well made black or very dark green glass, free from quartz grains or other enclosures. The colouring suggests iron, but if it is such, the particles are ultra-microscopic (957), (Bm. '24-901. Sq. 15'57'; 11' b.s.).

The only fragment dating from about the fourth century B.C. is part of a bangle (937, Bm. '19-623. Sq. 14'23'; 5' 6" b.s.). This has so completely corroded, that although it retains its original form, I am doubtful if any of the glass remains. The corrosion is yellow, but it is not clear if the glass was yellow or blue. The corrosion has started from numerous centres and made radiating spheres from each until it meets and combines with the next, with the result that the fragments, when examined microscopically, show an almost geometric structure of radiating lines and circumferential lines, making a sort of gadroon effect.

Other examples of blue and green glass dating from this period will be found in the description of the glass beads from the Bhir Mound.

The examples of the third century B.C. are all black fragments of bangles. One wide piece is very like obsidian in appearance, but microscopic examination shows that it is a black glass very much like the earlier specimen (957). It also has, I think, been coloured with iron. The specific gravities of these glasses are between 2.3 and 2.6, showing that there is certainly very little, and probably no lead used in their composition.

The specimen dated to the first century B.C. is a fragment of a very fine bowl. This was constructed by taking canes made of threads of white and colourless glass which have been twisted together so as to form a spiral, and then winding the canes, when plastic, round the inside of a mould and fusing them together with heat and pressure. To form the rim, a piece of blue and white glass has been used. This method was employed extensively by the Romans, and many similar specimens have been found at Pompeii and other sites. This technique was, at a later date, developed very extensively at Venice, and such glass was called "vitro di trina" or lace glass. We have no knowledge where the ancient specimens of this glass were made—possibly in several centres; but

from the quantities of fragments found in Europe especially in Mediterranean countries, it is probable that it originated in one of the countries bordering on that sea. The specific gravity is 2.51.

The pieces of glass dating from the first century A.D. include a fragment very similar to the last (959-Sk. '29-2143. Sq. 25.43'; 4' 6" b.s.), but in this case the canes are made of coloured glasses and are blue and white, and black and white alternately; the blue seems to be coloured with copper and the black probably with manganese. The specific gravity is 2.31.

To the same date belong several other fragments of bangles. Three are blue. No. 939 (Sk. '17-496. Sq. 64.82'; 3' 9" b.s.) has white corrosion slightly iridescent. Sp.g. 2.41. No. 940 (Sk. '26-2069. Sq. 126.47'; 1' 6" b.s.) has no corrosion; Sp.g. 2.49. This piece is of rough workmanship and may be local. No. 941 (Sk. '24-1437. Sq. 57.50'; 6" b.s.) is made by twisting a thread of glass. The corrosion on this is very heavy and of a yellow colour similar to No. 937; the Sp. g. is 2.38. I think that the colouring matter in these three specimens is copper. No. 942 (Sk. '16-301. Sq. 72.76'; 4' 6" b.s.) is a fragment of black glass bracelet with twisted pattern. This has a white corrosion; Sp.g. 2.43. No. 943 (Sk. '19-913) is part of a rather roughly made sulphur coloured glass bangle; Sp. g. 2.48. This glass is similar to the opaque yellow glass of the Sirkap beads, the structure of which is described later. No. 961 (Sk. '19-933/58) are two glass objects, probably game pieces.¹ They are corroded almost completely through. There is a suggestion of a pattern on them as though originally they were made of variegated glass. A microscopic examination of some of the dust appears to confirm this, as some portions are quite transparent and may have been a colourless glass, whilst a few of the fragments have minute patches of white opal glass that is quite opaque.

To this period are also to be assigned two fragments of very well made ribbed bowls of a type that is not infrequently found amongst Roman remains in Europe. No. 945 (Sk. '14-1381. Sq. 82.53'; 5" b.s.) is of amber coloured glass (Sp.g. 2.66); No. 947 (Sk. '26-2576. Sq. 71.49'; 6" b.s.) is blue (Sp.g. 2.47) and, I think, is coloured with copper.

Nos. 950 (Sk. '15-918. Sq. 31.44'; 5' 4" b.s.) and 951 (Sk. '19-933/17) are fragments of typical Roman blown flasks or bowls; the former is of a rather translucent green tinge with a Sp.g. of 2.43; the latter is the quite usual practically colourless glass.

Another portion from the bottom of a flask (No. 953, Sk. '13-953. Sq. 90.64'; 2" b.s.) of slightly greenish glass, has a corrosion with a curious metallic appearance, and looks as though some metal had been melted in it. This, however, is not the case, as a microscopic examination shows that the whole of what appears to be a metallic layer is corroded glass.

No. 949 (Sk. '17-554.—debris) is a fragment of a bottle of dark brown and white glass. The two glasses appear to be partly in layers and the material may have been folded over before being blown into a bottle.

¹ More probably, I think, pieces from encrusted glass-work.—[J. M.]

No. 952 (Sk. '16-3549—spoil earth) is the neck of an elaborately decorated bottle of a type found in Europe. In this case the white pattern is added on to a brown base, probably in the form of rings round the bottle before it was completely blown, the final design being produced partly by drawing the surface with a wire and partly by blowing the glass.

No. 954 (Sk. '13-1308. Sq. 72·51'; 4' 4" b.s.) is a large plano-conical blue glass, shaped like a lens. It is not, however, worked with a spherical curve and even if polished on the flat surface would be useless as a lens. I think it was only intended for an ornament¹, but on the other hand it is very much the size and thickness of some of the Roman lenses and may be an attempt at copying a lens by a person who did not know how to work a spherical surface.

Perhaps the most interesting specimens of glass sent over are the three fragments of brilliant red glass, Nos. 955 (Sk. '19-933/57), 956 (Dh. '16-618) and 960 (Sk. '19-933/61); the Sp. g.'s are respectively 3·47, 3·76 and 3·11. From the weight it is pretty certain that the first two contain a considerable percentage of lead. These two are both broken from lumps and are a very fine colour. The matrix of the second one is unusually colourless, and the crystals are large and well developed. In the first piece many of the crystals have the appearance of cigarettes. The third specimen is a thin strip. It also has a good colour but is corroded for a considerable distance; the crystals appear to be arranged more or less in rows or strata. It is probable that all these specimens have been made at a low temperature to avoid turning the cuprous oxide into metallic copper.

Although beads of this material and the closely allied orange form of cuprous oxide have been found at Sirkap, none of the red variety have been found in the Bhir Mound, the red beads from that site being coloured with metallic copper. A specimen of the orange variety, however, comes from that site.

No. 962 (Sk. '19-933/56) comprises some fragments of amber-coloured glass. These are very corroded. Minute chips under the microscope show a curious, very fine structure, but this may be a surface effect and not actual particles. I do not know what the colouring agent is.

No. 963 (Sk. '19-933/59) is a blue powder. This is a glass which has broken into a powder. The individual pieces have a number of white particles in them.

No. 958 (Dh. '13-5) is part of a tile. This is a copper blue glass of the first or second century A.D. Microscopically examined it shows very brilliant iridescence on some of the particles, but in some respects is very similar to the blue glasses from the Bhir Mound.

Glass Beads from the Bhir Mound

The most interesting beads from this site are the series of "eye beads" illustrated on Pl. I, Nos. 13 to 18. These beads are all virtually identical with beads found round the Mediterranean where they date from the ninth to the third

¹ Mr. Beck is no doubt right about these lenticular pieces. They were probably used for incrustation on metal.
—[J. M.]

century B.C. The date of exactly similar beads is given in connection with the various specimens. The resemblance is so close that I am convinced that these beads were either actually made in the Mediterranean area, or at least by men who came from that area, or who had learnt how to make them from workmen who came from Mediterranean countries.

It is a possibility that the Mediterranean beads came from Persia, but this is improbable, as specimens of such beads from that country are very uncommon. The suggested date for these beads, based on their findspots, is in one case fifth century B.C., that is, considerably before the time of Alexander. This early date would agree with the European evidence better than a later one, and, if correct, is another example of early trade relations between Europe and the East.

Bead No. 263 (Pl. I, No. 13) is an eye bead with plain spot eyes on an ultramarine ash base. In this case the white, instead of being put on in small rings round each eye, is put on as a thread wound several times round the bead. This is almost identical with some beads from Corsica, the only difference being that in the Corsican beads some of the eyes are plain spots like these, and some are stratified like those of the next specimen. The date of the Corsican beads is supposed to be about 700 B.C., but I think it might quite likely be about 500 B.C. I should not expect it to be as recent as the third century B.C., which is the date assigned to this bead from its findspot.

The blue eyes are made of a cobalt glass.

Bead No. 265 (Pl. I, No. 14). This bead also is practically identical with some of the beads from Corsica. It has seven stratified eyes, four have one brown and two white rings round, and three have two brown and three white rings round. The date of this specimen according to the findspot is about the fifth century B.C., and this would agree very much better with the Corsican specimens.

Bead No. 266 (Pl. I, No. 15). This bead is identical with those found in Etruscan tombs in Italy. It is not only the most common, but also the earliest of this type found, and has probably continued in use for the longest time. The earliest specimen comes from Enkomi in Cyprus, where it dates from about 1400 B.C. These beads in Italy are found in Benacci I, but are rare; are common in Benacci II; are rare in Arnolfi, and practically unknown in Italy after 500 B.C. The same beads are found at a much later date in France and England. Salomon Reinach dates the French to about 350 B.C., and until recently some found in England at Arras in Yorkshire and elsewhere have been thought to date from about 250 B.C.; but there is some question now as to whether the English ones are not a good deal earlier. It is very doubtful if this bead from Taxila can be as late as the sixth century B.C., which is the suggested date.

Bead No. 267 (Pl. I, No. 16). This bead is also very like an Etruscan bead but I have not seen a precise parallel to the arrangement of colours and eyes.

Bead No. 268 (Pl. I, No. 17). This eye bead is a type also found frequently in Mediterranean sites. The corrosion of the central spots and dark rings of

the eyes makes them look brown, but they are really cobalt blue. This corrosion is frequently found on sites such as Tharros in Sardinia, and it is possible, that some of the beads from that site are not earlier than 500 B.C. Similar beads, however, from Italy, Amathos in Cyprus, and Tel Fara in Palestine, are in most cases referable to about 700 B.C.

Bead No. 269 (Pl. I, No. 18). A similar bead to this from a Mediterranean site, possibly from Tharros in Sardinia, was associated with an Assyrian seal which has been dated in the tenth to eighth century B.C. The type probably lasted on for a long time.

A bead similar to this series has been found at Sirkap and the date suggested for this is first century A.D. If a large number were found at this spot it would suggest that they were being made there and that the process had been carried on at Taxila for centuries. As, so far as I know, only a few—possibly only one—specimen, has been found, the probability is that it was an antique at the time. The wearing of antique beads was very extensively carried on in Egypt and probably in other countries as well.

The question as to whether these beads were imported or made on the spot by European workmen is difficult to prove, but the difficult, yet perfect, technique points to their having been made by much more skilful workmen than many of the other beads found on this site. I should therefore expect these elaborate beads to be imported and the rougher ones to be of local manufacture.

The other glass beads from the Bhir Mound, some of which are of interest, are as follows:—The numbers refer to the numbers in the Taxila Museum list.

The Red Glass Beads, Nos. 226 (Bm. '24-130. Sq. 19-57'; 5' 3" b.s.), 227 (Bm. '24-272. Sq. 26-57'; 8' b.s.), 228 (Bm. '21-599. Sq. 9-52'; 7' 9" b.s.) and 229 (Bm. '19-1108.' Spoil earth) are all of the same glass; the sp. g. is 2.48. A microscopic examination shows that it is copper glass, the copper being held in the form of small particles of metal, many of them about 1/60000 inch diameter, and spaced about 1/20000 inch apart. (Circa, 4th-3rd century, B.C.)

The glass is identical, and the shape similar to beads from the Malay Peninsula, provisionally dated 900 A.D.¹ Except for a slightly more corroded surface it resembles glass from the middens near the megalithic tombs at Sulur, in South India. These middens are dated about 600 A.D. Identical beads have been found near Zanzibar, not accurately dated, though some have been associated with Sung pottery. A very similar glass is also found among the ruins near Zimbabwe in Rhodesia, and similar beads are occasionally found in Egypt, where they are called Roman.

Beads of this sort of glass have certainly been made much earlier in Egypt, but the earliest specimens are not cane beads. The two beads Nos. 226 and 227 are undoubtedly made from cane.

The Orange Glass bead No. 230 (Bm. '19-543. Sq. 119-34'; 6' b.s.), sp.g. 2.55 to 2.60, is probably made from cane. Similar beads made from this glass are found in India, Malaysia and Europe. At the present time, antique

Bead No. 230.

¹ A recent discovery makes it probable that some of the finds from this site in the Malay Peninsula date from A.D. 400 or 500.

beads of this glass have a high value along the Malabar Coast, a far higher value than similar beads of red glass. I have not seen this glass from Rhodesia or Egypt. A microscopic examination shows that the colouring matter is cuprous oxide in the rare orange form. The structure is exactly similar to the Anglo-Saxon orange yellow glass. (Circa, fourth century B.C.)

Bead No. 231.

This is an "inverted flower" pendant (Pl. IX, 1) in white glass, dating from the third century B.C. Sp.g. 2.5. The material is a good quality opal glass of the ordinary type, but the shape is entirely new to me, and this pendant obviously not of European manufacture, but probably local. For a similar bead, but in carnelian, see Pl. IV, No. 34.

Bead No. 232.

Third century B.C. (Bm. '20-162. Sq. 38.27'; 4' 7" b.s.) The blue glass from which this is made is very difficult to match exactly. It practically agrees with a small wire-wound bead from Egypt, of which the date is uncertain. I should expect this to be local. Sp. g. between 2.4 and 2.5.

Bead No. 233.

Third century B.C. Yellow plano-conical scaraboid. Sp. g. 2.31. Of greenish yellow glass. The colour is very likely due to accident, possibly iron introduced as an impurity in the ingredients. The shape is found in the Aegean as early as 1400 B.C. and is also found at Ur; date not specified, but fairly early. Such beads were not infrequently engraved on the flat, and used as seals. I should expect this to be of Eastern manufacture. Bm. '21-546. Sq. D. 65'; 1' b.s.

Bead No. 234.

Blue spacer. Sp.g. 2.45 to 2.5. Third century B.C. This spacing bead is one of a series of beads or pendants (Nos. 240, 241, 245, 246, 255, 258, 261) made of a glass frequently found in the Mediterranean area and the Crimea. It occurs for a considerable time, being found from 700 to 200 B.C. These beads are either imported from the West, or made in an exactly similar manner as European beads and from the same material. The colour of the bead is probably due to copper. Bm. '19-1504. Sq. 13.26'; 3' 6" b.s.

Bead No. 235.

Plano-convex circular bead. (Circa, fourth century B.C.) Sp.g. between 2.35 and 2.4. Moulded out of amber glass. Local manufacture. Bm. '20-1492. Sq. 29.29'; 5' 8" b.s.

Beads No. 236.

Three small blue beads; sp. g. between 2.48 and 2.5. Third century B.C. These beads are made from cane. The material appears to be coloured with cobalt. Bm. '19-202. Sq. 8.45'; 3' 3" b.s.

Bead No. 238.

Third century B.C. Pear-shaped bead of blue glass; sp.g. 2.35; colouring probably cobalt. Curiously crackled surface, possibly made from cane. This may be the same glass as that used for the base in the eye beads Nos. 266-267, but the corrosion and crackling are different. Bm. '24-672. Sq. 31.35'; 5' b.s.

Bead No. 239.

Third century B.C. Multiple spiral glass bead (Pl. IX, 2); sp.g. between 2.35 and 2.34; three spiral right hand white lines. Each thread makes a complete round. Beads of this type are rare and I have not seen any exactly similar, but spiral beads with three start spirals in faience and lapis are found at Ur, and belong to an early period. A microscopic examination of the black glass shows that it is deep green to transmitted light when very small pieces are viewed.

In reflected light (ring illuminator) the particles show brilliant opalescent colours, chiefly ruby red. Small particles scarcely seen by transmitted light are brilliant when examined with the ring illuminator.

Third century B.C. Hexagonal barrel in green glass; sp.g. 2·35 to 2·34. Bead No. 240. A very common shape. See Bead No. 234. Bm. '19-239. Sq. 14·14'; 3' b.s.

Fourth century B.C. Hexagonal barrel, almost colourless (Pl. IX, 3); Bead No. 241. sp.g. 2·35 to 2·40. Cf. No. 234.

Third century B.C. Hexagonal barrel, almost colourless (Pl. IX, 3); sp.g. Bead No. 242. 2·35 to 2·40. Cf. No. 234.

Fourth century B.C. Tabular hexagonal bicone; sp.g. 2·35 to 2·40. Very pale blue. The flattened hexagonal shape is found in beads from Mycenean tombs, but it is generally barrel-shaped, not bicone. Bm. '20-1335. Sq. 28·27'; 5' 6" b.s.

Fifth century B.C. A pendant of similar glass to No. 234 (Pl. IX, 4). This form of pendant is similar to bronze ones in Italy; beads of the same glass but shorter stems come from the Crimea. Bead No. 245.

Fourth century B.C. Square barrel glass. Cf. No. 234. The shape is found in S. India and Mesopotamia; sp. g. between 2·35 and 2·4. Bm. '24-644. Sq. 10·61'; 6' b.s.

Fifth century B.C. Cornerless cube of glass, like No. 238. The shape is very common in the Mediterranean, Egypt, Mesopotamia, Persia, etc.; sp.g. 2·35. Bm. '19-2052. Sq. 6·59'; 12' b.s.

Fourth century B.C. Very rough plano-conical bead, greenish; sp.g. 2·35 to 2·4. This does not look European and is probably Eastern. Bm. '19-675. Sq. 8·45'; 5' 6" b.s.

Fourth century B.C. Blue glass; sp.g. 2·35 to 2·4. Probably cobalt. Probably Eastern. Bm. '19-72. Sq. 8·45'; 6' b.s.

Third century B.C. Club-shaped pendant of pale green glass. (Pl. VII, 5.) Sp.g. 2·35 to 2·4.

Fourth century B.C. Triangular pendant of green glass. (Pl. VII, 6.) Sp.g. 2·35 to 2·4.

Fourth century B.C. Bud pendant. (Pl. VII, 7.) Sp.g. 2·35 to 2·4. Bead No. 253.

Fourth century B.C. Bud pendant. Sp.g. 2·35 to 2·4. Bm. '19-1665. Sq. 45·9'; 6' 9" b.s.

All these pendants are unusual and of non-European shapes. They are probably Eastern.

Third century B.C. Bicone bead of copper blue glass (Pl. IX, 8). This is a folded bead, and, as often happens, the joint has corroded away, leaving a gap which goes nearly through the bead. Beads of this shape and colour were used in Egypt during the XXV Dynasty, and are found in the Mediterranean area from 900 B.C. Bead No. 255.

Fifth century B.C. Small blue bicone; sp.g. between 2·45 and 2·5. I cannot exactly match this bead, but it is extremely like the palest of the XVIII. Dynasty turquoise glasses in Egypt. Bm. '19-1303. Sq. 24·13'; 10' 3" b.s.

Bead No. 257. Third century B.C. Green scaraboid of glass; sp.g. just over 2.5. This is unlike European work and resembles green jade. I cannot match the glass in Europe. Bm. '24-624. Sq. 35.28'; 3' b.s.

Bead No. 258. Third century B.C. Square faceted pendant (Pl. IX, 9); sp.g. between 2.45 and 2.5. Pyramid has roughly carved base. This pendant, which is of amber colour, may have come from the Crimea. Cf. No. 234.

Bead No. 259. Third century B.C. Black glass barrel; sp.g. 2.45. A microscopic examination shows a greenish tint with a few large particles, some red, but quite a different glass from No. 239. Bm. '20-140. Sq. 35.63'; 3' b.s.

Bead No. 260. Sixth century B.C. Bicone of green glass (Pl. I, 27) with red patch; sp.g. 2.35. This looked like a red cuprous oxide bead which had corroded green. A microscopic examination, however, makes me think that the red is a recent stain. This bead and the disintegrated cylinder are two of the earliest pieces of glass sent from Taxila, and this specimen has corroded in a very curious way, having crackled all over and being in considerable danger of disintegrating altogether like the cylinder. A microscopic examination shows that the glass is a fairly pure material, but there is some crystalline material amongst it, possibly only the remains of the sand it was buried in.

Bead No. 261. Fifth century B.C. Ball pendant of green glass, with sp.g. under 2.35. (Pl. IX, 10.)

Bead No. 270. Third century B.C. Cornerless cube in green glass (Pl. VII, 11); sp.g. between 2.35 and 2.4. Each surface has a groove cut across it each way, making an X. This device I have not seen before; it may be local.

The Glass Beads from Sirkap

Ninety-three glass beads from this site have been examined. With the exception of four of red glass and one very corroded specimen, all the beads had a lower specific gravity than 2.68, and 69 of them had a sp. g. of either 2.50 or less. The clear glass is in many cases highly iridescent, and has in all specimens a sp.g. below 2.50. It is similar to some of the beads from the Bhir Mound and appears to be made of the same glass as that found in the Eastern Mediterranean and Crimea, where it was used over a long period extending from at least 700 B.C. to 200 B.C.

The transparent blue and green glasses are closely allied. There are two definite colouring matters used for the blue glass, some being coloured with cobalt, but the majority apparently with copper.

One particular variety of semi-transparent pale blue glass is like that used for a number of beads found in Europe, which have somewhat different dates assigned to them in different places. In Bohemia they are said to date from about 100 B.C., but in Britain to be of late Roman date.

The brilliant orange glass is the same as that in Bead No. 230 from the Bhir Mound and is coloured with the yellow form of cuprous oxide.

The opaque red beads are made of two materials. Some are made of a glass in which the colouring matter is copper in its metallic form in minute

particles, like the glass of the beads sent from the Bhir Mound. In all such specimens sent for examination, the sp. g. is low. A few beads, however, have a higher specific gravity and are coloured with red cuprous oxide. The imitation charm case (Pl. IX, 23) has a sp. g. of 3.68, and the glass is impregnated with large crystals of cuprous oxide. From the number and purity of these it is almost certain that the colouring matter was put into it in the form of cuprous oxide and that the crystals are not the result of a chemical combination during manufacture. This indicates that the glass cannot have been heated to a high temperature whilst being made, or the cuprous oxide would have been converted to metallic copper. This glass is the same as the fragments Nos. 955, 956 and 960 already referred to under the various samples of glass from different sites.

The opaque green glass (Nos. 533, 544, 565, 567, 568, 598) is also a glass coloured by copper. It is found very frequently on the middens at Sulur, Tin-nivelli and Tangul, where it is supposed to date from about the sixth century A.D. Beads of this material were traded extensively, possibly by Arabs, over a very large area including South Africa, India and the Malay Peninsula. The green beads now found in such large quantities in the neighbourhood of Zanzibar appear to be of the same material.

One bead (No. 540), shown on Pl. I, 21, is made of a violet-coloured opaque glass, not at all like cobalt. The glass is new to me and it is impossible to say what the colouring matter is without analysis.

The opaque yellow glass (Beads Nos. 511, 535, etc.) consists of a clear matrix in which a number of brilliant yellow masses float. Exactly what these masses are has not at present been ascertained, but they are coloured with ferric oxide. Glass of this sort has been made from before 1200 B. C., until at least as recently as the seventh or eighth century A.D., but I cannot trace any being made at the present time.

Certain variations in this opaque yellow glass are observable. For instance, the sulphur-coloured bangle (No. 943) when examined under the microscope, has in addition to the usual yellow masses, a number of minute red spots. I am not certain if these are particles of an iron salt, but they have a close resemblance to certain forms of rust. Also the yellow band on the black bangle No. 936 contains in addition to the ordinary yellow masses, a number of orange cubic crystals. These crystals are probably the same material as the amorphous yellow masses but crystallized out. The colouring matter is probably ferric oxide.

The small bright green bead (No. 553) is in appearance very like eighteenth century beads from China, but the Chinese beads have a higher sp. g. In fact, there seems to be no real similarity between any of the glass beads from Taxila and the ones from China. This is especially marked with reference to the early Chinese beads, as all of these that I have tested have an altogether higher sp. g. than those from Taxila. There are, however, some beads of low specific gravity found in some of the Korean tombs of the Sila Dynasty (A.D. 600).

The majority of the glass beads from Sirkap are of ordinary shapes, the most frequent are cylinder and barrel, both hexagon and circular; oblate; spherical; and bicone.

The following beads are of interest. Unless otherwise stated, they date from the first century A.D.

No. 512 (Pl. IX, No. 12). Hexagon cylinder made of two kinds of glass.

No. 527 (Pl. IX, 13), No. 528 (Pl. I, 23). These barrel beads with chevron patterns are made by twisting the bead when it is hot. I have a similar bead but in black and white glass, from Damascus, the date of which is not known, but it is probably about the beginning of the Christian Era. The date of these two specimens is first century B.C. and first century A.D. respectively.

No. 530 (Pl. IX, 14). Tabular circular with collars.

No. 536 (Pl. IX, 15). Gadrooned cylinder with collars. This is made of a clear colourless glass but has a good deal of iridescence.

No. 541 (Pl. I, 22). Bicone; a good specimen of copper blue glass.

No. 544 (Pl. IX, 16). Bicone of blue glass with zones at the ends; made of cuprous oxide red glass. This is the only bead from Taxila with a combination of these two glasses. This specimen is only a fragment.

No. 570 (Pl. IX, 17). Segmented bead of blue glass made from cane.

No. 572 (Pl. IX, 18). Spacing bead for five threads.

No. 574 (Pl. IX, 19). Spherical bead made from cane. The cane which was used for this, was made in layers, possibly with metal foil in between. The intermediate layer, however, has corroded away, leaving the innermost layer like a loose ball inside the outer.

No. 578 (Pl. IX, 20). This specimen is highly iridescent and like some of the Crimean beads.

No. 593 (Pl. IX, 21). Cornerless cube in pale green glass.

No. 594 (Pl. IX, 22). Drop pendant in pale green glass.

No. 596 (Pl. IX, 23). Amulets like this are evidently a copy in glass of the little charm cases made in gold and other metals, which had a written charm inside them.

No. 597 (Pl. IX, 24). First century B.C. Gadrooned pear-shaped bead of transparent red glass. Both the material and shape of this bead are unusual.

No. 598. Vase pendant in green glass (Pl. IX, 25).

No. 599. Drop pendant in amber glass (Pl. IX, 26). This is a Crimean type.

No. 600. Flat or axe-shaped pendant in amber-coloured glass with white decoration (Pl. IX, 27). This also is very like the Mediterranean amulets.

No. 602. Ball pendant in bright yellow glass (Pl. IX, 28). This is an unusual type, as it has small depressions or panels moulded in it.

No. 605. Folded zone bead with cobalt blue base and white zone (Pl. IX, 29).

No. 606. Simple Spot Eye bead (Pl. I, 20). This is an unusual type; it has a blue base probably coloured with copper, and six raised very pale yellow spots or eyes. On at least two of these red patches can be seen which show that a composite cane of yellow and red glass was used for making the eyes.

No. 607. Eye bead with pale blue base and three eyes of stratified layers of cobalt blue and white glasses. This is a Mediterranean type, almost identical with those from the Bhir Mound. This bead must therefore either have been

an old bead when buried at Taxila, or else the manufacture of these elaborate beads must have been continued to a much later date than we have any direct evidence for elsewhere. Sk. '28-1387. Sq. 64-102'; 7' b.s.

No. 608. Granulated bead of blue and brown glass (Pl. I, 24). I have not seen a bead of this form before.

No. 609. Eye bead of peculiar type (Pl. IX, 30). This also is a very unusual type of bead.

No. 612. Spiral bead (Pl. IX, 31). This is a spherical bead with black glass base and three white right hand spirals. Each spiral has about one and a half turns.

No. 403. Black oblate glass bead with red longitudinal stripes (Pl. I, 26). This bead is very like some of the later trade beads, but as it seems of considerable age, it may be one of the early beads from which the trade beads of later times were copied.

Glass Beads from other sites at Taxila

The glass beads from the Dharmarājikā Stūpa are specially interesting on account of the accuracy with which many of them can be dated. The twisted cylinder (Pl. IX, 38) is similar to beads from the Bhiṣ Mound and from Damascus; this specimen dates from the first century A.D.

The pendant (Pl. IX, 36) is so corroded that it is difficult to say for certain that it is glass, but I think it is a similar glass to the fragment of bangle No. 937. It is a typically Indian form, as are also the tetrahedron (No. 32), and the curious vase-shaped bead (No. 35).

The square cylinder (No. 37) with chamfered corners and a large collar, is peculiar, but I think it originally had a collar at each end. The segmented glass beads, Nos. 33 and 34, are of doubtful date, but show considerable resemblance to some of the Roman beads.

From Jāndīāl comes a very good imitation of an agate (No. 39). It is a folded bead and shows the joint clearly. Another bead from the same site (No. 40) is a moulded glass square. It has a chequer pattern pressed into the glass, and gold foil cemented or stuck by heat on the depressed squares. I think that this bead is either mediaeval or modern.

FAIENCE

The material of which so many Egyptian beads are made and which is called "faience", is closely allied to the present day quartz bricks. It is composed chiefly of grains of quartz, which have had a small amount of lime added and then been fused until the surface of the quartz grains has flowed and cemented the whole into a solid mass. In some cases the glaze appears to have been mixed with the grains, and, if this glaze is coloured, beads made in this way show the colour right through. It is more usual, however, to find that the colour does not penetrate far into the surface of the bead. The method by which such beads could be made in Egypt in such vast quantities has never been satisfactorily explained, but the practice continued with varying intensity from the predynastic to the Roman period.

Faience was made in smaller quantities, though still fairly extensively, in Mesopotamia, and probably in Crete and several other countries¹. Very few specimens have come from Taxila. If the faience, when manufactured, is not mixed correctly or heated sufficiently, it has a tendency to break up and often disintegrates into powder when handled; on the other hand, some faience, especially some of the Mesopotamian faience, is of very great hardness, and must have been made at a very high temperature. In some intermediate forms the surface flakes away and leaves a material like pottery².

From the Bhir Mound there are very few specimens of faience. The beads numbered 271 and 272 are, I consider, a true faience. A microscopic examination of their material shows that it consists of a great number of quartz grains and a yellow material that, in my opinion, is the remains of corroded glaze.

There are several specimens from Sirkap. The fist amulet, with the thumb held between the first and second fingers (Pl. X, 1), is a very interesting specimen³. A series of granulated faience beads come from the same site. Two of these are illustrated in Pl. X, Nos. 2 and 3. No. 4 on the same Plate is a very irregular rayed bead of faience. The two double crescent beads Nos. 46 and 47, also from Sirkap, are the same shape as some found in Mesopotamia, where they are dated to a much earlier period than these from Sirkap, all of which are of the first century A.D.⁴. The other faience bead illustrated (Pl. X, 7) is a very rough gadrooned bead which has been glazed blue. This bead is dated from its findspot as between the first and fifth century A.D., and is quite indistinguishable from similar beads from Persia referable to the 14th century A.D.⁵.

POTTERY

Among the beads from the Bhir Mound is a square barrel made of red pottery, which has had a black glaze on it, some of which still remains (Pl. X, 8). A microscopical examination shows that this is a vitreous glaze and probably coloured with iron.

Another very interesting bead of pottery is the panel bead (Pl. X, 9). This is the same shape as a glazed quartz bead from Persia, of which the date is not known but which may be mediaeval. This specimen is from the Bhir Mound and dates from the third century B.C.

Another bead from the Bhir Mound and of the same date, is the barrel (Pl. X, 10), which has zones cut near the ends to give the effect of collars. This appears

¹ For faience at Mohenjo-daro in Sind, of the 3rd and 4th millennia B.C., cf. Marshall, *Mohenjo-daro and the Indus Civilization*, pp. 32, 37, 205, 221, 229, 346-53, 385-7, 394-6, 514, 533, 570-6, 579-81, 686-88.

² For faience beads in Britain, see 'Faience Beads of the British Bronze Age' by H. C. Beck and J. F. S. Stone in *Archaeologia*, Vol. LXXXV.

³ This is the familiar *fica* gesture. For a gold band from Olbia in South Russia of about the same period, cf. *Brit. Mus. Cat. of Jewellery*, No. 2964 and Pl. LXVIII. In this instance, however, the thumb does not appear to be clasped between the first and second fingers, though it is described in the Catalogue as making the *fica* gesture. —[J. M.]

⁴ For other double-crescent beads, see *Gold and Silver Jewellery*, No. 76, and *Copper and Bronze Objects*, Nos. 37, 38, 40, 41, 106-8, 168-76; and cf. A. S. R., 1902-3, p. 158.—[J. M.]

⁵ For gadrooned beads of faience from Charsada belonging to the 1st-3rd century A.D., cf. A. S. R., 1902-3, p. 158, and Pl. XXXVIII, b. 2.—[J. M.]

to be made of a sort of hard pottery or terracotta. The same shape is found both in Southern India and Mesopotamia.

A bead from Sirkap (Pl. X, 11) is of similar material to the last; it appears to represent a vase or pot of some sort but is an unusual form.

A sort of barrel-shaped bead from Jāndiāl (Pl. X, 12) has a series of longitudinal lines moulded in it. I do not know what material this is made of, but it appears to be something of the nature of bitumen¹. It dates from some time after the first century A.D.

PEARL

There are numbers of pearls from various sites, but most of them are small and some very irregular in shape. The most interesting one is the specimen from Lālchak (Pl. VIII, 44) which has had the ends ground away so as to make it a short barrel, instead of leaving it an approximate sphere.

CORAL

Ten beads of coral were included among the selected specimens. One was a very fine specimen of a leg and foot amulet (Pl. X, 31). It is from the Dharmājikā Stūpa and dates from the middle of the first century B.C. Most of the others were simply irregular pieces of coral perforated and, in a few cases, very roughly shaped. One piece from the same site as the last may have been used as a toggle (Pl. X, 32).

BONE AND IVORY AND SHELL

Only 15 bone or ivory beads were sent. Seven of these came from the Bhir Mound, seven from Sirkap, and one from Jāndiāl. Six of these are figured on Pl. X, 13-18. Two of these are from the Bhir Mound (Nos. 17 and 18), both dating from the fourth century B.C.; the first is a barrel with collars and the second a large oblate bead. The former is very like a bead from Jāndiāl (No. 13) which was made some centuries later.

There are two ornamental spacing beads of shell from Sirkap; one (No. 16) has a ring and dot pattern, the other (No. 15) has a lozenge design. Another bead of ivory also from Sirkap (No. 14) may represent a *triratna*.

BERYL

This stone has the same base as emerald and aquamarine; the emerald, however, has a more brilliant colour. Eleven beads are included in the selected specimens; one of these, a hexagonal cylinder, is shown on Pl. I, 28, and another, a hexagonal barrel, on Pl. X, 19.

¹This is very likely, and the depressions in it were probably intended for pieces of inlay.—[J. M.]

Almost all the specimens sent are well made beads of pale blue colour. The two specimens illustrated are respectively of the fifth and first century B.C., but some of the others date from the first century A.D.

LIMESTONE

There are two beads of white limestone figured on Pl. X, Nos. 20 and 21. One is a barrel bead from Lālchak dating from the fourth or fifth century A.D. The other, from the Dharmarājikā Stūpa, is of uncertain date, but looks like an earlier bead.

Two other beads from Sirkap (Pl. X, Nos. 22 and 23) are made of "abri" stone. It appears to be a sort of nummulitic limestone, brown in colour and is full of fossils. Both beads are rather unusual shapes. No. 22 is a truncated pyramid, and No. 23 is a hexagonal cylinder of flattened form, with chamfered ends.

STEATITE AND SERPENTINE

There are very few steatite beads. In many countries this is one of the favourite materials, especially in the Indus civilization.

An amulet, possibly representing a comb (Pl. X, 24), is made of a soft brown potstone or steatite; it is from Sirkap and dates from the first century B.C. Another very curious bead (Pl. X, 25) is made of a red serpentine. This bead, which is called a mitre bead, is of a shape which I have only seen from Persia.

Six beads are of blue serpentine, which is not unlike turquoise but is an altogether softer stone. One of these beads, which may possibly represent a *triratna*, is illustrated on Pl. I, 25, and two others on Pl. X, Nos. 26 and 27. The former is a rectangular cylinder with zones near the ends, and slightly concave ends. No. 27 is a ball pendant.

SHALE

There are a few beads of shale; one of these (No. 28) is made of siliceous shale and has a curious cutting on one side which may be meant to represent an animal. Another (No. 29) is a cornerless cube in which the corners are only slightly chamfered so as to leave octagonal surfaces. This is made of a sedimentary shale which is slightly siliceous.

JET (?)

Two beads were sent over from Sirkap made of a very fragile material which is extremely like a black material used for beads in the Crimea during the Greek period. It is frequently called black amber, but Dr. Thomas of the Jermyn

Street Museum, has tested some from the Crimea and considers it more closely allied to jet.

One of the beads (No. 30) is also interesting on account of its shape. It is a cube in which each side has been cut down to a pattern like a four-leaved flower. This material has a specific gravity of 1.37.

VOLCANIC TUFF

A barrel bead of volcanic tuff or lava comes from Jāndiāl. Beads of this material are not uncommon in Mesopotamia.

FELSPAR

It is rather surprising to find only a single specimen of this material, and that an extremely small barrel bead. It comes from Lālchak and is made of microcline felspar, a material that is very extensively used for making beads in some countries.¹

IRON PYRITES

Two small natural crystals of this material have been perforated to make beads. They are quite similar, and having been given one number, appear as one bead in the list of beads of different materials on p. 54.

CALCIFIED WOOD

One spherical bead with very large perforation is made of a form of limestone with organic structure. It appears to be a calcified wood.

In conclusion, I wish to acknowledge my indebtedness to Dr. H. H. Thomas for identifying several of these materials for me; and I wish also to emphasise what I have already stated regarding the use of beads for chronological purposes. The subject has been so little studied, and the dates assigned to similar beads in different countries vary so greatly, that much more work is required before any certain results can be arrived at. At the present time it is only possible to balance probabilities. Two facts tend greatly to complicate the subject; the first is that in some cases similar beads continued to be manufactured over a long period; the second is that it has been the practice in many countries and at many periods to wear antique beads.

On the other hand, there are many beads of so distinctive a character that when they are found in two or more different places, one can be sure that there was some trade or other connection between them, and, speaking generally, that their civilizations were contemporary.

¹ White orthoclase felspar is used in jewellery of the 1st century A.D. at Taxila. For the use of green microcline felspar or amazonite in prehistoric times, *cf. Marshall, op. cit.*, pp. 32, 523, 545-6, 678. [J. M.]

List of Selected Specimens, Classified according to Materials.

Material.	Bhir Mound.	Sirkap.	Dharma Stupa.	Jandial.	Sisukh.	Lalchak.	Bhalar Tope.	Mohra Moradu.	Total No. sent.	Number Illustrated.
Agate	77	58	21	15	3	1	1	3	179	66
Amethyst	13	8	4	—	—	—	—	—	25	13
Beryl	2	3	5	1	—	—	—	—	11	2
Bone and Ivory	7	7	—	1	—	—	—	—	15	7
Carnelian	51	32	11	8	3	2	1	1	109	72
Chalcedony	10	2	1	1	—	—	—	—	14	8
Coral	1	1	8	—	—	—	—	—	10	2
Faience and Pottery	9	16	4	2	2	—	—	1	34	16
Felspar	—	—	—	—	—	1	—	—	1	—
Garnet	7	6	17	1	1	2	—	—	34	12
Glass	45	105	25	12	6	—	3	—	196	56
Granite	2	1	—	—	—	—	—	—	3	2
Jasper, green	6	10	3	—	1	—	—	—	20	6
Jasper with haematite	2	—	—	—	—	—	—	—	2	—
Jet (?)	—	2	—	—	—	—	—	—	2	1
Lapis lazuli	7	11	8	6	2	1	1	1	37	12
Limestone nummulitic	—	3	—	—	—	—	—	—	3	2
Limestone white	—	—	1	—	—	1	—	—	2	1
Malachite	—	4	1	—	—	1	—	—	6	3
Mother of Pearl	9	2	5	—	—	—	—	—	9	2
Pearl	3	2	3	—	1	1	—	—	10	1
Pyrites	—	—	1	—	—	—	—	—	1	—
Quartz	11	18	18	6	1	2	—	—	56	28
Quartz, glazed	—	15	2	—	—	—	—	—	17	13
Serpentine Blue	—	6	—	—	—	—	—	—	6	2
Serpentine Red	—	3	—	—	—	—	—	—	3	1
Shale	—	3	3	—	—	—	—	—	6	2
Shell	24	42	23	15	7	1	3	2	117	48
Steatite	—	2	—	—	—	—	—	—	2	—
Tuff, volcanic	—	—	—	1	—	—	—	—	1	—
Wax (?)	—	1	—	—	—	—	—	—	1	—
Wood calcified	1	—	—	—	—	—	—	—	1	—
Missing	—	—	2	—	—	—	—	—	2	—
	280	363	166	69	27	13	9	8	935	379

The following is a list of specimens sent from Taxila arranged in group numbers. The ordinary figures show the numbers sent, and the *italics* figures show the number illustrated. The total numbers in this list do not agree with the actual numbers sent or illustrated, since about 50 specimens are entered in two groups. These are for the most part either etched beads or spacing beads. The former are entered under group XLVIII.A.11 as etched carnelian or agate beads and also under the group where their form or decoration would place them. In the same way some of the spacing beads are entered twice.

The regular beads are divided into their classes and particulars of these are shown on Pl. XII. The special form beads and the irregular ones are shown divided into groups and a list of these groups is shown at the end of the description of the Plates.

Regular Groups Nos. I to XVI.

Group.	1a.	1b.	1c.	1d.	1f.	1g.	2b.	2c.	2f.	2g.	4db.	Totals.
I A.	2	3	3 <i>2</i>	..	..	..	5	..	..	..	..
I B.	47 <i>3</i>	16 <i>2</i>	8 <i>1</i>	..	..	1	16 <i>1</i>	6 <i>3</i>	8 <i>3</i>	2	1	
I C.	79 <i>2</i>	4	..	..	..	3	5 <i>1</i>	3 <i>1</i>	..	1 <i>1</i>	..	
I D.	1 <i>1</i>	88 <i>11</i>	1	..	..	2 <i>1</i>	12 <i>2</i>	5	..	..	..
I Total	129 <i>6</i>	111 <i>13</i>	7 <i>3</i>	..	..	6 <i>1</i>	38 <i>4</i>	14 <i>4</i>	8 <i>3</i>	3 <i>1</i>	1	317 <i>36</i>
II B.	1 <i>1</i>	2 <i>2</i>	..	..	..	..	3 <i>1</i>	..	..	..	..
II C.	1 <i>1</i>	2 <i>1</i>	..	..	..	..	1	..	..	..	..
II D.	1 <i>1</i>	10 <i>2</i>	..	..	..	..	2 <i>1</i>	..	..	..	..
II Total	3 <i>3</i>	14 <i>5</i>	..	..	..	..	6 <i>2</i>	..	..	..	..	23 <i>18</i>
IV B. . . . .	..	..	..	..	..	..	..	..	..	1 <i>1</i>	..	
IV C.	2 <i>2</i>	..	..	..	..	..	..	..	..	..	..
IV D.	2 <i>1</i>	..	..	..	..	..	1 <i>1</i>	..	..	..	..
IV Total	4 <i>2</i>	1	..	..	..	..	1 <i>1</i>	..	1 <i>1</i>	..	..	7 <i>4</i>
V B. . . . .	..	..	..	..	..	..	..	..	..	1 <i>1</i>	..	
V C.	3	..	..	..	..	..	1 <i>1</i>	..	..	..	..
V D.	7	3 <i>1</i>	..	..	..	..	1 <i>1</i>	..	..	..	..
V Total	10	3 <i>1</i>	..	..	..	..	2 <i>2</i>	..	1 <i>1</i>	..	..	16 <i>4</i>
VI C.	2	..	..	..	..	..	..	..	..	..	..	2
VII C.	2 <i>1</i>	..	..	..	..	..	..	..	..	..	..	2 <i>1</i>
VIII B. . . . .	..	1	..	..	1 <i>1</i>	..	1	..	..	..	..
VIII D. . . . .	..	2 <i>2</i>	..	..	..	..	..	..	..	..	..
VIII Total . . . .	..	3 <i>2</i>	..	..	1 <i>1</i>	..	1	..	..	..	..	3 <i>3</i>

Regular Groups Nos. I to XVI—contd.

Group	1a.	1b.	1c.	1e.	1f.	1g.	2b.	2e.	2f.	2g.	4db.	Totals.
IX A.	..	..	..	..	..	..	2	..	..	..	..	..
IX B.	3	3	..	..	..	..	3	..	4	2	..	..
IX C.	1	..	..	..	..	..	1	1	..	..	..	..
IX D.	..	3	1	..	..	..	5	1	1	..	..	..
IX Total	4	6	1	..	..	..	11	2	1	4	2	26 5
X B.	..	..	1	..	..	..	..	..	1	..	..	..
X C.	4	..	..	..	..	..	1	3	1	..	..	..
X D.	..	6	3	..	..	..	1	4	2	..	..	..
X Total	4	6	3	1	..	..	1	5	2	3	1	21 6
XI B.	1	..	..	..	..	..	..	..	..	..	..	..
XI C.	1	1	..	..	..	..	..	..	..	..	..	..
XI Total	2	1	..	..	..	..	..	..	..	..	..	2 1
XII B.	..	2	1	..	1	..	..	..	..	..	..	..
XII C.	..	1	1	..	..	..	..	..	..	2	1	..
XII D.	..	4	..	..	..	..	1	1	1	..	..	..
XII Total	..	7	2	..	1	..	..	11	1	2	1	12 4
XIII B.	..	6	2	..	..	..	..	..	3	3	..	..
XIII C.	..	4	2	..	..	..	..	3	..	..	..	..
XIII D.	1	27	9	..	..	..	29	5	5	4	2	..
XIII Total	1	37	13	..	..	..	32	5	8	4	5	53 22
XIV D.	..	1	..	..	..	..	..	..	..	..	..	1
XVI B.	1	..	..	..	..	..	..	..	..	..	..	..
XVI C.	7	..	..	..	..	..	1	..	1	..	..	..
XVI D.	..	3	1	..	..	..	..	..	1	1	1	..
XVI Total	8	3	1	..	..	..	1	..	2	1	1	15 2
Groups I to XVI Total.	169	13	192	47	8	3	1	1	1	8	19	532 97

Carried forward :

Sub-division III Special forms—

			No. sent
Group XVII	.	.	37 25
Group XVIII	.	.	6 3
Group XIX	.	.	51 23
Group XX	.	.	2 —
Group XXI	.	.	1 1
Group XXII	.	.	55 43
Group XXIII	.	.	16 8
Group XXV	.	.	5 3
Group XXVI	.	.	2 2
Group XXVII	.	.	7 5
Group XXVIII	.	.	8 8
Group XXIX	.	.	37 31
Group XXX	.	.	1 1
Group XXXI	.	.	2 2
Group XXXII	.	.	12 12
Group XXXIII	.	.	8 8
Group XXXIV	.	.	14 13
Group XXXV	.	.	2 2
Group XLII	.	.	10 10
Group XLVI	.	.	43 38
Group XLVII	.	.	30 23
Group XLVIII	.	.	68 56
			417 317

Sub-division IV. Irregular and unclassified—

Group XLIX	.	.	12
Group L	.	.	14
Unclassified and fragments	.	.	13 39 —
			Grand Total 988 414

N.B.—These totals do not agree with those in the list of Materials used, as about 50 beads are entered in two groups.

DESCRIPTION OF PLATES

- I.—Colour plate of various beads.
- II.—(a) Etched Beads of agate and carnelian.
(b) Cemented beads.
- III.—Agate beads.
- IV.—Carnelian beads.
- V.—Quartz Beads.
(a) Glazed quartz beads.
(b) Plain quartz beads.
- VI.—(a) Amethyst and malachite beads.
(b) Lapis and granite beads.
(c) Garnet beads.
(d) Jasper beads.
- VII.—Amulets representing animals, etc., of various stones.
- VIII.—Shell beads.
- IX.—Glass beads.
- X.—(a) Faience beads.
(b) Pottery beads.
(c) Bone and ivory beads.
(d) Beads of sundry stones, etc.

The beads on Plate I are shown on a scale of one and a half (3 : 2); all the other beads illustrated are natural size (1 : 1). Most of the dates assigned to the beads in the lists following are deduced from the stratification of the sites, but the beads may in some cases be considerably older. The dates are approximate only.

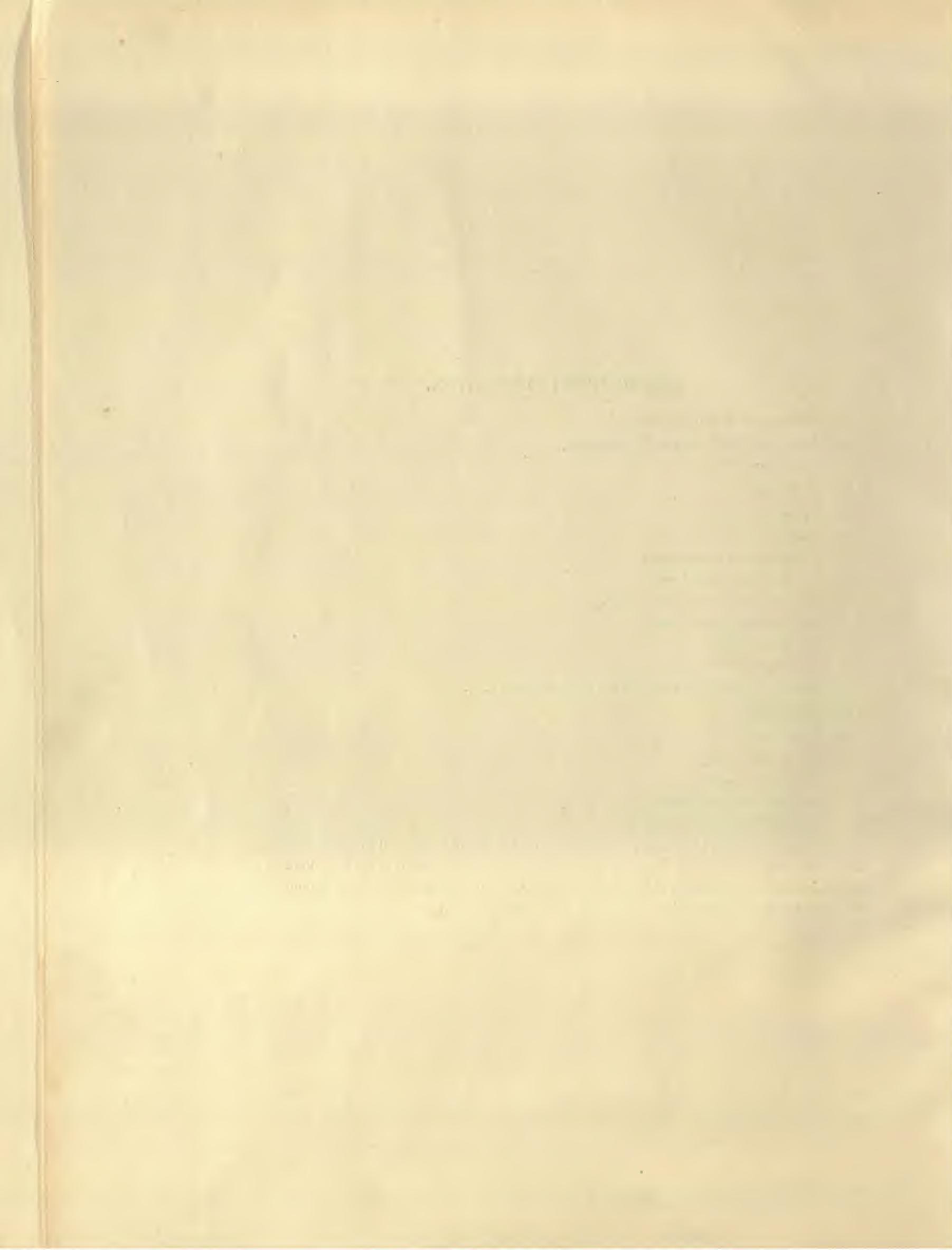


PLATE I.

1 341 Etched carnelian zone bead. XLVII.A.1., XLVIII.A.11. Sirkap. Sk. ' 16-109. Sq. 68-72'; 6' 6" b.s. 1st cent. A.D.

2 399 Etched carnelian. XLVII.A.3.e., XLVIII.A.11. Sirkap. Sk. ' 15-739. Sq. 162-105'; 2' 2" b.s. 1st cent. A.D.

3 378 Etched agate zone bead. XLVII.A.1., XLVIII.A.11. Sirkap. Sk. ' 12-878. Sq. 67-94'; 5' b.s. 1st cent. A.D.

4 337 Etched carnelian cube. XLVIII.A.11. Sirkap. Sk. ' 13-20. Sq. 87-62; 1' 4" b.s. 1st cent. A.D.

5 105 Etched tabular carnelian bead. XXIX.A.1., XLVIII.A.11. Bhir Mound. Bm. ' 21-1073. Sq. 46-20'; 3' 11" b.s. 3rd cent. B.C.

6 370 Etched agate zone bead. XLVII.A.2., XLVIII.A.11. Sirkap. Sk. ' 13-178. Sq. 62-58'; 3' b.s. 1st cent. B.C.

7 846 Etched agate eye bead. XLVI.A.4., XLVIII.A.11. Jandīl. Jl. ' 12-97. D. 97. after 1st cent. A.D.

8 166 Cemented stone eye bead. XLVI.A.1.a. 2.b. Bhir Mound. Bm. ' 20-47. Sq. 23-59'; 2' 11" b.s. 3rd cent. B.C.

9 691 Glazed quartz lion. XXXII.A.18. Dharmarājikā Stūpa. Dh. ' 14-587. St. B.6; 8' 8" b.s. 1st cent. A.D.

10 63 Agate eye bead. XLVI.A.1.a. Bhir Mound. Bm. ' 20-971. Sq. 25-26'; 3' 2" b.s. 3rd cent. B.C.

11 50 Agate barrel bead. I.D.1.b. Bhir Mound. Bm. ' 21-764. Sq. 96-104'; 2' 5" b.s. 3rd cent. B.C.

12 672 Carnelian eye bead. XLVI.A.1.a., 1.b. Dharmarājikā Stūpa. Dh. ' 15-1429. St. U.1. 1st cent. B.C.

13 263 Stratified eye bead of glass. XLVI.A.7.b. Bhir Mound. Bm. ' 20-1385. Sq. 18-29'; 3' 11" b.s. 3rd cent. B.C.

14 265 Stratified eye bead of glass. XLVI.A.7.b. Bhir Mound. Bm. ' 24-899. Sq. 15-59'; 11' b.s. 5th cent. B.C.

15 266 Impressed (?) eye bead of glass. XLVI.A.6.a. Bhir Mound. Bm. ' 19-513. Sq. 10-36'; 3' 6" b.s. 3rd cent. B.C.

16 267 Stratified eye bead of glass. XLVI.A.7.a.2. Bhir Mound. Bm. ' 21-188. Sq. 32-43'; 3' 7" b.s. 3rd cent. B.C.

17 268 Stratified eye bead of glass. XLVI.A.7.a.2. Bhir Mound. Bm. ' 19-2102. Sq. 15-14'; 3' b.s. 3rd cent. B.C.

18 269 Stratified eye bead of glass. XLVI.A.7.a.2. Bhir Mound. Bm. ' 21-474. Sq. 34-6'; 2' 7" b.s. 3rd cent. B.C.

19 607 Stratified eye bead of glass. XLVI.A.7.a.1. Sirkap. Sk. ' 28-1387. Sq. 64-102'; 7' b.s. 1st cent. A.D.

20 606 Simple spot eye bead of glass. XLVI.A.2.a. Sirkap. Sk. ' 26-3932. 1st cent. A.D.

21 540 Bicone of purple glass. I.B.2.f. Sirkap. Sk. ' 27-246. Sq. 76-95'; 2' 9" b.s. 1st cent. A.D.

22 541 Bicone of blue glass. I.B.2.f. Sirkap. Sk. ' 27-485. Sq. 45-86'; 3' 3" b.s. 1st cent. A.D.

23 528 Glass spiral bead. XVIII.A.3. Sirkap. Sk. ' 22-939. Sq. 53-86'; 3' 6" b.s. 1st cent. A.D.

24 608 Glass granulated bead. XXV.A.3.b. Sirkap. Sk. '14-1597. Sq. 78-76'; 5' 8" b.s. 1st cent. A.D.

25 436 Blue serpentine. XXIX.B.23. Sirkap. Sk. '22-546. Sq. 50-92'; 2' 6" b.s. 1st cent. A.D.

26 403 Spherical striped bead of black and red glass. XLVII.A.2. Sirkap. Sk. '24-1209. Sq. 41-44'; 3' 6" b.s. 1st cent. A.D.

27 260 Bicone bead of glass. I.B.2.e. Bhir Mound. Bm. '20-199. Sq. 14-53'; 13' 10" b.s. 6th to 7th cent. B.C.

28 237 Hexagon cylinder of beryl. XIII.D.1.b. Bhir Mound. Bm. '20-222. Sq. 24-40'; 8' 7" b.s. 5th cent. B.C.

29 677 Yellow quartz hexagon barrel. XIII.D.1.b. Dharmarājikā Stūpa. Dh. '15-1429. St. U. 1. 1st cent. B.C.

30 72 Elliptical agate barrel. II.D.1.b. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.



PLATE II.

Etched Agate and Carnelian Beads.

1 70 Etched dodecahedron on sphere of black agate. XIX.A.3., XLVIII.A.11. Bhir Mound. Bm. '21-795. Sq. 45-64'; 3' 3" b.s. 3rd cent. B.C.

2 160 Etched eye bead of black agate. XLVI.A.1.e., XLVIII.A.11. Bhir Mound. Bm. '19-535. Sq. 10-14'; 2' 6" b.s. 3rd cent. B.C.

3 152 Etched zone bead of black agate. XLVII.A.1., XLVIII.A.11. Bhir Mound. Bm. '24-618. Sq. 31-36'; 3' 8" b.s. 3rd cent. B.C.

4 101 Etched zone bead of carnelian. XLVII.A.1., XLVIII.A.11. Bhir Mound. Bm. '19-1255. Sq. 24-13'; 10' 3" b.s. 5th cent. B.C.

5 159 Etched spot eye bead of black agate. XLVI.A.1.e., XLVIII.A.11. Bhir Mound. Bm. '21-850; Sq. 41-123'; 1' 9" b.s. 3rd cent. B.C.

6 157 Etched zone bead of black agate. XLVII.A.1., XLVIII.A.11. Bhir Mound. Bm. '20-37. Sq. 39-28'; 1' b.s. 3rd cent. B.C.

7 104 Etched zone barrel bead of carnelian. XLVII.A.1., XLVIII.A.11. Bhir Mound. Bm. '21-711. Sq. 44-83'; 1' 4" b.s. 3rd cent. B.C.

8 103 Etched eye bead of carnelian. XLVI.A.4., XLVIII.A.11. Bhir Mound. Bm. '20-1330. Sq. 28-27'; 5' 6" b.s. 4th cent. B.C.

9 102 Etched wave bead of carnelian. XLVII.A.3.e., XLVIII.A.11. Bhir Mound. Bm. '20-566. Sq. 11-37'; 3' b.s. 3rd cent. B.C.

10 100 Etched wave bead of carnelian. XLVII.A.3.e., XLVIII.A.11. Bhir Mound. Bm. '19-803. Sq. 13-26'; 9' b.s. 5th cent. B.C.

11 113 Etched tabular bead of carnelian. X.C.2.e., XLVIII.A.11. Bhir Mound. Bm. '21-369. Sq. 32-47'; 7' 11" b.s. 4th cent. B.C.

12 99 Etched zone barrel bead of carnelian. XLVII.A.1., XLVIII.A.11. Bhir Mound. Bm. '21-432. Sq. 10-51'; 5' 3" b.s. 4th cent. B.C.

13 107 Spacing bead of carnelian etched with white triangles. XVII.A.3., XLVIII.A.11. Bhir Mound. Bm. '21-712. Sq. 47-72'; 6' 10" b.s. 4th cent. B.C.

14 106 Etched double-axe bead of carnelian. XXVIII.A.1., XLVIII.A.11. Bhir Mound. Bm. '19-761. Sq. 13-23'; 7' b.s. 4th cent. B.C.

15 108 Etched double-axe bead of carnelian. XXVIII.A.1., XLVIII.A.11. Bhir Mound. Bm. '19-790. Sq. 11-34'; 7' 5" b.s. 4th cent. B.C.

16 109 Etched spot eye bead of chalcedony. XLVI.A.1.e., XLVIII.A.11. Bhir Mound. Bm. '20-352. Sq. 19-40'; 4' 9" b.s. 3rd cent. B.C.

17 379 Etched barrel bead of black agate. XIX.A.3., XLVIII.A.11. Sirkap. Sk. '13-2. Spoil earth. 1st cent. A.D.

18 400 Sphere with etched dodecahedron of black agate. XIX.A.4., XLVIII.A.11. Sirkap. Sk. '14-2446. Spoil earth. 1st cent. A.D.

19 402 Etched eye bead of black agate. XLVI.A.1.a.1.a., XLVIII.A.11. Sirkap. Sk. '24-835. Sq. 46-52'; 8' b.s. 1st cent. A.D.

20 364 Etched barrel bead of black agate. XIX.A.3., XLVIII.A.11. Sirkap. Sk. '16-946. Sq. 10-64'; 6' 5" b.s. 1st cent. A.D.

21 401 Etched sphere of black agate. XLVII.A.2., XLVIII.A.11. Sirkap. Sk. '12-673. Sq. 142-69'; 6' b.s. 1st ? cent. A.D.

22 351 Etched barrel zone bead of plum-coloured agate. XLVII.A.1., XLVIII.A.11. Sirkap. Sk. '23-21. Sq. 19-92'; 2' b.s. 1st cent. A.D.

23 340 Etched oblate wave bead of carnelian. XLVII.A.3.a., XLVIII.A.11. Sirkap. Sk. ' 19-462. Spoil earth. 1st cent. A.D.

24 339 Spherical eye bead of carnelian. XLVI.A.4., XLVIII.A.11. Sirkap. Sk. ' 24-1024. Sq. 44-44'; 8" b.s. 1st cent. A.D.

25 338 Barrel etched with zones, of carnelian. XLVII.A.1., XLVIII.A.11. Sirkap. Sk. ' 13-1. Purchased. 1st cent. A.D. ?

26 330 Etched spot eye bead of carnelian. XLVI.A.1.c., XLVIII.A.11. Sirkap. Sk. ' 26-2277. Sq. 102-52'; 4" b.s. 1st cent. A.D.

27 586 Etched Spot Eye bead of carnelian (second process). XLVI.A.1.c., XLVIII.A.11. Sirkap. Sk. ' 18-2062. Sq. 113-50'; 5' 3" b.s. 1st cent. A.D.

28 827 Etched barrel bead of carnelian. XLVII.A.1., XLVIII.A.11. Jandial. Jl. ' 12-86. D. 86. 1st cent. A.D. or later.

29 665 Etched spot eye bead of carnelian. XLVI.A.1.c., XLVIII.A.11. Dharmarājikā Stūpa. Dh. ' 13-1341. St. I. 3; 1' 6" b.s. 2nd cent. A.D. or later.

30 Etched carnelian now at Cambridge, said to have come from Taxila.

31 Etched carnelian now at Cambridge, said to have come from Taxila.

32 215 Button bead of white agate, probably chemically treated. XLII.A.4. Bhir Mound. Bm. ' 24-939. Sq. 10-58'; 12' 6" b.s. 7th to 6th cent. B.C.

33 262 Barrel of agate with collars, burnt or chemically treated. I.D.1.b. Bhir Mound. Bm. ' 20-1443. Sq. 30-50'; 3' 9" b.s. 3rd cent. B.C.

Cemented Eye Beads.

34 209 Cemented eye bead of shell with hollow ground in base to insert pupil. XLVI.A.1.a. 2.b. Bhir Mound. Bm. ' 21-545. Sq. 9-54'; 6' 8" b.s. 4th cent. B.C.

35 202 Barrel of shell with quartz plates cemented on. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 21-1416. Sq. 45-67'; 2' 1" b.s. 3rd cent. B.C.

36 176 Cemented spherical eye bead of agate. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 24-57. Sq. 10-62'; 4' 6" b.s. 3rd cent. B.C.

37 212 Base for spherical cemented eye bead of agate. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 20-926. Spoil earth. 3rd cent. B.C.

38 164 Cemented spherical eye bead of chalcedony and carnelian. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 24-464. Sq. 33-34'; 4' b.s. 3rd cent. B.C.

39 167 Barrel cemented eye bead of agate. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 19-905. Sq. 40-10'; 5' 8" b.s. 4th cent. B.C.

40 163 Oblate base of cemented eye bead; chalcedony. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 20-340. Sq. 32-41'; 6' 6" b.s. 4th cent. B.C.

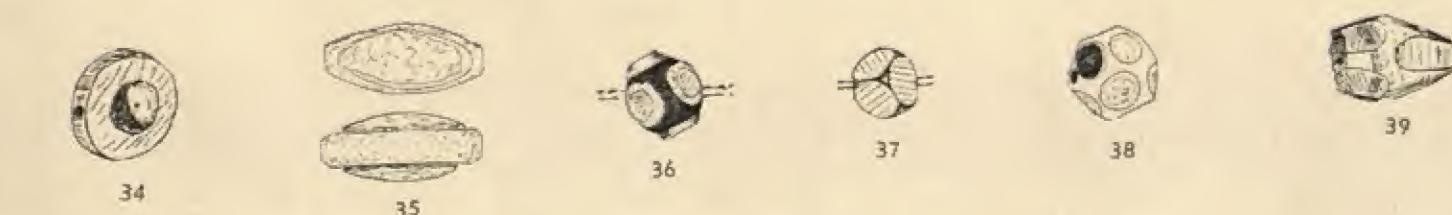
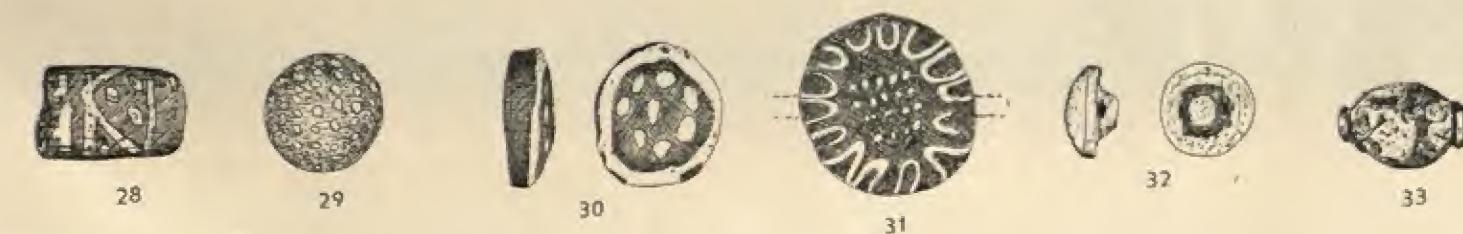
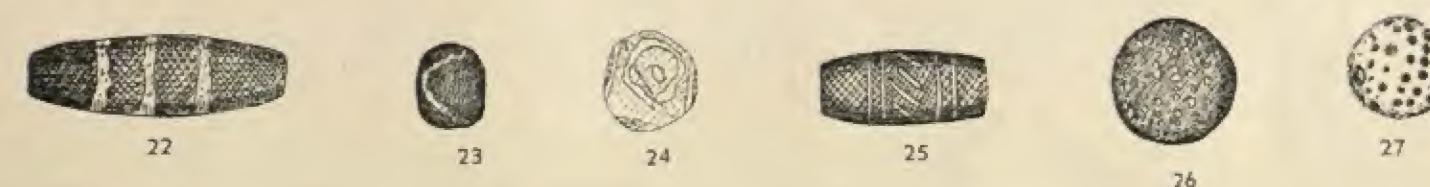
41 161 Cemented eye bead of agate. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 24-281. Sq. 11-55'; 4' 3" b.s. 3rd cent. B.C.

42 162 Base of cemented eye bead of very pale carnelian. XLVI.A.1.a.2.b. Bhir Mound. Bm. ' 24-399. Sq. 25-25'; 5' 4" b.s. 4th cent. B.C.

43 397 Elaborate base for cemented eye bead of chalcedony. XLVI.A.1.a.2.b. Sirkap. Sk. ' 19-820. Sq. 76-102'; 5' 10" b.s. 1st cent. A.D.

44 396 Base of cemented eye bead of chalcedony. XLVI.A.1.a.2.b. Sirkap. Sk. ' 12-1004. Sq. 63-63'; 9' b.s. 1st cent. A.D.

45 398 Base of cemented eye bead of chalcedony. XLVI.A.1.a.2.b. Sirkap. Sk. ' 28-322. Sq. 59-102'; 4' 6" b.s. 1st cent. A.D.



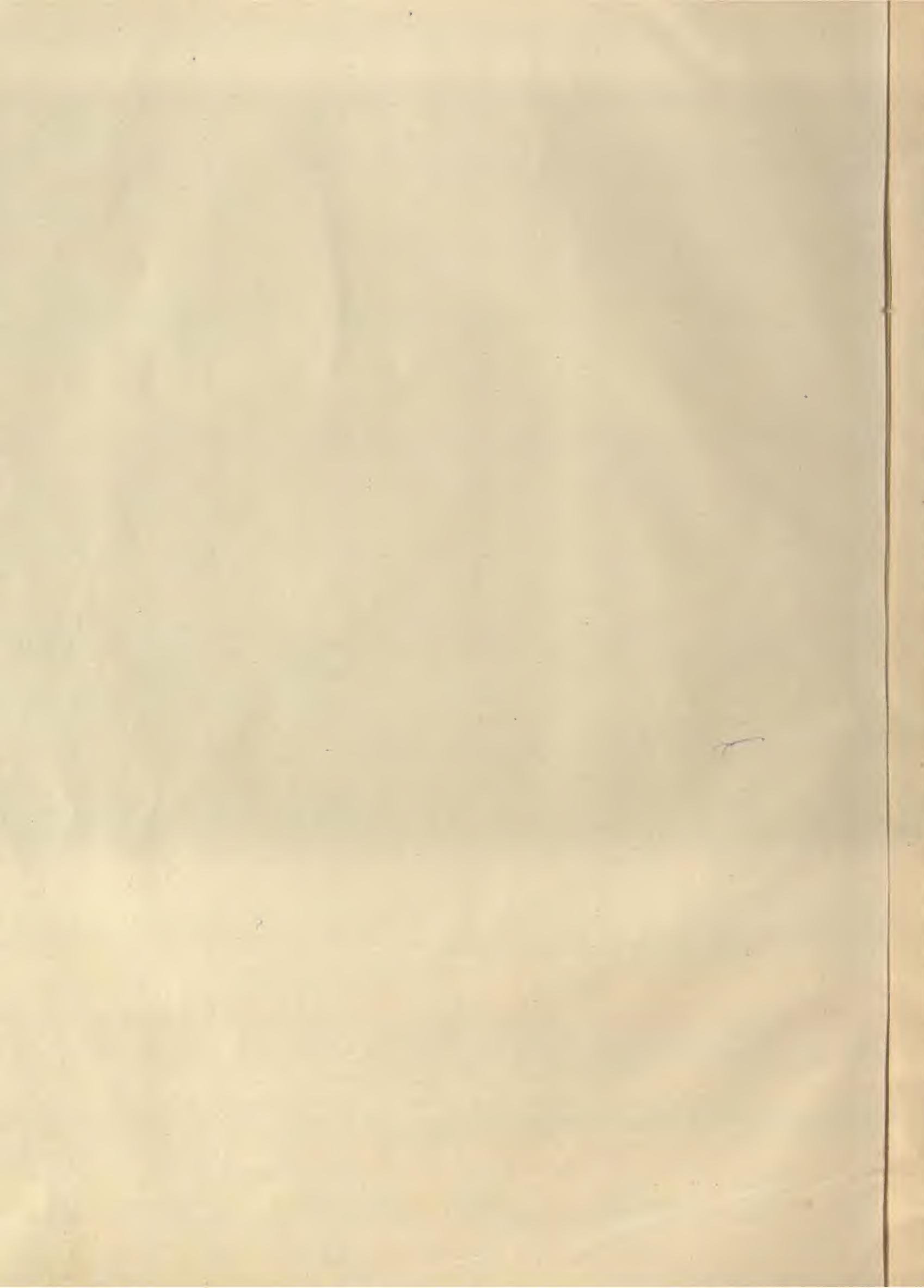


PLATE III.

1 66 Flattened leech bead of agate. XLVIII.A.4. Bhir Mound. Bm. ' 21-196. Sq. 9-51'; 14' 6" b.s. 7th-6th cent. B.C.

2 68 Flattened leech bead of agate. XLVIII.A.4. Bhir Mound. Bm. ' 20-1003. Sq. 37-10'; 8' b.s. 4th cent. B.C.

3 65 Flattened leech bead of agate. XLVIII.A.4. Bhir Mound. Bm. ' 22-886. Sq. 26-26'; 3' 9" b.s. 3rd cent. B.C.

4 58 Flattened leech bead of agate. XLVIII.A.4. Bhir Mound. Bm. ' 20-887. Sq. 27-26'; 2' 8" b.s. 3rd cent. B.C.

5 59 Flattened leech bead of agate. XLVIII.A.4. Bhir Mound. Bm. ' 20-975. Sq. 27-27'; 3' 9" b.s. 3rd cent. B.C.

6 71 Flattened leech bead of agate. XLVIII.A.4. Bhir Mound. Bm. ' 12-20/12. 3rd cent. B.C.

7 45 Pyramid pendant of agate. XXII.B.4.a. Bhir Mound. Bm. ' 20-1205. Sq. 26-27'; 4' b.s. 3rd cent. B.C.

8 47 Pyramid pendant of agate. XXII.B.4.a. Bhir Mound. Bm. ' 20-1134. Sq. 26-27'; 3' 8" b.s. 3rd cent. B.C.

9 49 Triangular pendant of agate. XXII.B.3.a. Bhir Mound. Bm. ' 20-973. Sq. 25-26'; 3' 2" b.s. 3rd cent. B.C.

10 69 Pendant, square in section; agate. XXII.B.2. Bhir Mound. Bm. ' 21-811. Spoil-earth. 3rd cent. B.C.

11 172 Dagger pendant of agate. XXVIII.B.4. Bhir Mound. Bm. ' 20-1470. Sq. 27-27'; 7' b.s. 4th-3rd cent. B.C.

12 33 Drop pendant of agate. XXII.B.2. Bhir Mound. Bm. ' 21-180. Sq. 27-60'; 6' 10" b.s. 4th-3rd cent. B.C.

13 26 Drop pendant of agate. XXII.B.2. Bhir Mound. Bm. ' 24-514. Sq. 26-57'; 11' b.s. 5th cent. B.C.

14 42 Ball pendant of agate. XXII.B.1. Bhir Mound. Bm. ' 21-475. Sq. 33-6'; 3' 2" b.s. 3rd cent. B.C.

15 30 Elliptical ellipsoid of agate. II.D.1.a. Bhir Mound. Bm. ' 24-302. Sq. 10-55'; 8' 6" b.s. 5th-4th cent. B.C.

16 36 Zone bead of agate. I.B.1.b. XLVII.A.1. Bhir Mound. Bm. ' 19-962. Sq. 24-13'; 6' b.s. 3rd cent. B.C.

17 40 Plano-convex ellipsoid of agate. V.D.1.a., XLVI.A.1.a.1.a. Bhir Mound. Bm. ' 19-507. Sq. 14-11'; 2' b.s. 3rd cent. B.C.

18 133 Barrel of agate. I.D.1.b. Bhir Mound. Bm. ' 21-830. Sq. 45-72'; 3' 6" b.s. 3rd cent. B.C.

19 151 Nandipada of agate. XXIX.B.22. Bhir Mound. Bm. ' 20-1393. Sq. 26-27'; 4' 7" b.s. 3rd cent. B.C.

20 41 Flattened hexagonal bicone of agate. XIII.D.2.e. Bhir Mound. Bm. ' 24-613. Sq. 16-54'; 8' b.s. 3rd cent. B.C.

21 28 Elliptical ellipsoid of agate. II.B.1.a. Bhir Mound. Bm. ' 24-17. Sq. 14-56'; 2' b.s. 3rd cent. B.C.

22 60 Barrel of agate. I.D.1.b. Bhir Mound. Bm. ' 12-20/12. 3rd cent. B.C.

23 153 Cross bead agate. XXIX.A.1. Bhir Mound. Bm. ' 19-1496. Sq. 45-8'; 5' b.s. 3rd cent. B.C.

24 264 Eye bead of agate. XLVI.A.1.a.1.a. Bhir Mound. Bm. '20-638. Sq. 28-59'; 12' b.s. 6th-5th cent. B.C.

25 63 Eye bead of agate. VII.C.1.a. Bhir Mound. Bm. '20-971. Sq. 25-26'; 3' 2" b.s. 3rd cent. B.C.

26 38 Eye bead of agate. I.C.1.a. Bhir Mound. Bm. '24-530. Sq. 32-46'; 8' 4" b.s. 5th cent. B.C.

27 154 Tetrahedron of agate. XIX.A.2. Bhir Mound. Bm. '19-1263. Sq. 10-36'; 9' 5" b.s. 5th cent. B.C.

28 424 Double pentagon of agate. XIX.A.6. Sirkap. Sk. '29-238. Sq. 12-89'; 12' 2" b.s. 1st cent. B.C.

29 455 Pendant of agate. XXII.B.4. Sirkap. Sk. '19-933/38. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

30 392 Truncated pyramid bead of agate. XLVIII.A.13. Sirkap. Sk. '13-1. Purchased. 1st cent. A.D. ?

31 359 Cornerless cube bead of agate. XIX.A.1. Sirkap. Sk. '19-817. Sq. 53-120'; 4' 2" b.s. 1st cent. A.D.

32 423 Cornerless cube bead of agate. XIX.A.1. Sirkap. Sk. '14-301. 1st cent. A.D.

33 712 Eye bead of agate. XLVI.A.1.a.1.a. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 6" b.s. 1st cent. B.C.

34 714 Zone bead of agate. XLVII.A.1. Dharmarājikā Stūpa. D. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

35 719 Toggle bead of agate. XLII.A.5. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

36 708 Drop pendant of agate. XXII.B.2. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

37 707 Flattened leech bead of agate. XLVIII.A.4. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

38 842 Cornerless cube bead of agate. XIX.A.1. Jāndiāl. Jl. '12-97. D. 97. 1st cent. A.D. or after.

39 844 Chevron bead of agate. II.C.1.a. Jāndiāl. Jl. '12-87. D. 87. 1st cent. A.D. or after.

40 929 Barrel bead of agate. I.D.1.b. Mohrā Morādu. Mn. '15-224. 2nd to 5th cent. A.D.

41 849 Convex cone bead of agate. II.B.1.c. Jāndiāl. Jl. '12-166. 4' b.s. 1st cent. A.D. or later.



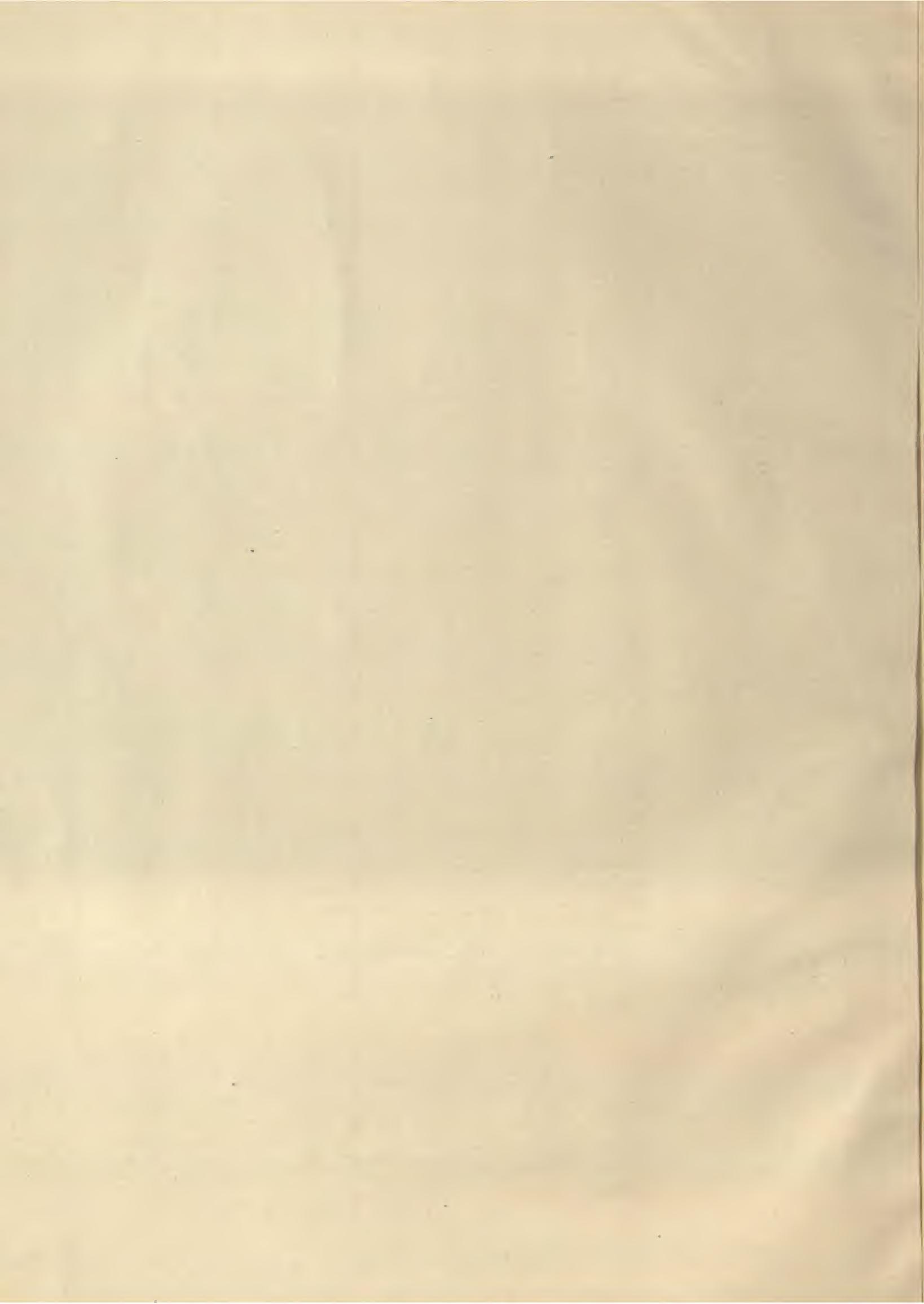


PLATE IV.

- 1 116 Hexagon cylinder bead of carnelian. XIII.B.2.b. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.
- 2 83 Flattened hexagon barrel of carnelian. XIII.D.1.b. Bhir Mound. Bm. '19-1881. Sq. 39-10'; 15' b.s. 7th to 6th cent. B.C.
- 3 93 Diamond circular bead of carnelian. XI.B.1.a. Bhir Mound. Bm. '20-600. Sq. 9-53'; 6' 11" b.s. 4th cent. B.C.
- 4 119 Triangular barrel bead of carnelian. VIII.D.1.b. Bhir Mound. Bm. '20-1123. Sq. 27-27'; 4' 8" b.s. 3rd cent. B.C.
- 5 82 Cornerless cube bead of carnelian. XIX.A.1. Bhir Mound. Bm. '19-378. Sq. 12-31'; 5' 3" b.s. Circa 4th cent. B.C.
- 6 85 Club pendant of carnelian. XXII.B.2. Bhir Mound. Bm. '20-200. Sq. 34-64'; 10' b.s. Circa 5th cent. B.C.
- 7 76 Dagger-shaped pendant of carnelian. XXVIII.B.4. Bhir Mound. Bm. '19-1254. Sq. 13-24'; 3rd cent. B.C.
- 8 77 Flattened leech bead of carnelian. XLVIII.A.4. Bhir Mound. Bm. '21-1052. Sq. 54-38'; 3' 5" b.s. 3rd cent. B.C.
- 9 98 Flattened leech bead of carnelian. XLVIII.A.4. Bhir Mound. Bm. '20-833. Sq. 26-26'; 3' 9" b.s. 3rd cent. B.C.
- 10 94 Bent head of carnelian. XLVIII.A.12. Bhir Mound. Bm. '19-592. Sq. 8-45'; 4' 6" b.s. 3rd cent. B.C.
- 11 117 Collared ball of carnelian. XXI.B.2.b. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.
- 12 118 Inverted drop pendant of carnelian. XXII.B.5. Bhir Mound. Bm. '19-243. Sq. 25-59'; 10' 8" b.s. 5th cent. B.C.
- 13 84 Pendant carnelian. XXII. Bhir Mound. Bm. '21-1475. Sq. 27-64'; 3' b.s. 3rd cent. B.C.
- 14 88 Cross bead of carnelian. XXIX.A.1. Bhir Mound. Bm. '20-1354? Sq. 25-27'; 5' 3" b.s. 4th-3rd cent. B.C.
- 15 91 Vase bead of carnelian. XXIX.A.15. Bhir Mound. Bm. '21-478. Sq. 28-6'; 2' 9" b.s. 3rd cent. B.C.
- 16 74 Tablet pendant edged round with crescents; carnelian. XXIX.A.3. Bhir Mound. Bm. '21-510. Sq. 11-53'; 6' 8" b.s. 4th cent. B.C.
- 17 78 Tooth or claw pendant of carnelian. XXX.T.B.3. Bhir Mound. Bm. '19-512. Sq. 14-11'; 2' 3" b.s. 3rd cent. B.C.
- 18 75 Spiral ear-ring of carnelian. XXVIII.A.1.a. Bhir Mound. Bm. '20-1132. Sq. 26-27'; 3' 8" b.s. 3rd cent. B.C.
- 19 124 Axe amulet of carnelian. XXVIII.B.1. Bhir Mound. Bm. '21-1488. Spoil-earth. 3rd cent. B.C.
- 20 96 Toggle bead of carnelian. XLII.A.5. Bhir Mound. Bm. '21-13. Sq. 33-44'; 8' b.s. 4th cent. B.C.
- 21 114 Triratna of carnelian. XXIX.A.23. Bhir Mound. Bm. '19-1590. Sq. 6-55'; 9' 6" b.s. 5th-4th cent. B.C.
- 22 336 Triratna of carnelian. XXIX.A.23. Sirkap. Sk. '20-207. Sq. 35-57'; 2' 9" b.s. 1st cent. A.D.
- 23 323 Double drop pendant of carnelian. XXII.B.8. Sirkap. Sk. '14-119. Sq. 41-77'; 9" b.s. 1st cent. A.D.

24 335 Double comb bead of carnelian. XXIX.A.24. Sirkap. Sk. ' 26-683. Sq. 140-59'; 4' 8" b.s. 1st cent. A.D.

25 344 Drop pendant of carnelian. XXII.B.2. Sirkap. Sk. ' 14-2461. Kunāla Stūpa. 1st cent. A.D.

26 322 Cowry of carnelian. XXVII.A.2. Sirkap. Sk. ' 29-1043. Sq. 55-118'; 4" b.s. 1st cent. A.D.

27 319 Drop pendant of carnelian. XXII.B.2. Sirkap. Sk. 22-412. Sq. 11-93'; 7" b.s. 1st cent. A.D.

28 332 Bell amulet of carnelian. XXII.B. Sirkap. Sk. ' 13-20. Sq. 67-62'; 1' 4" b.s. 1st cent. A.D.

29 331 Square bicone bead of carnelian. IX.B.2.f. Sirkap. Sk. ' 16-109. Sq. 68-72'; 6" 6" b.s. 1st cent. A.D.

30 329 Vase pendant of carnelian. XXIX.A.15. Sirkap. Sk. ' 16-763. Sq. 50-61'; 6" b.s. 1st cent. A.D.

31 603 Drop pendant of carnelian. XXII.B.2. Sirkap. Sk. ' 12-228. Sq. 48-77'; 3' 6" b.s. 1st cent. A.D.

32 321 Chamfered cylinder of carnelian. I.C.2.bf. Sirkap. Sk. ' 12-1005. Sq. 69-69'; 3' 4" b.s. 1st cent. A.D.

33 342 Irregular incised carnelian. XLVII.A.11. Sirkap. Sk. ' 19-252. Sq. 80-98'; 9" b.s. 1st cent. A.D.

34 334 Inverted flower pendant of carnelian. XXVI. sundry, XXII.B. Sirkap. Sk. ' 13-51. Sq. 61-59'; 1' 10" b.s. 1st cent. A.D.

35 675 Flattened leech bead of carnelian. XLVIII.A.4. Dharmarājikā Stūpa. Dh. ' 15-1429. St. U. 1. 1st cent. B.C.

36 670 Double pentagon bead of carnelian. XIX.A.5. Dharmarājikā Stūpa. Dh. ' 14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

37 674 Barrel of carnelian. I.B.2.b. Dharmarājikā Stūpa. Dh. ' 15-1429. St. U. 1. 1st cent. B.C.

38 673 Lenticular spherical of carnelian. IV.C.1.a., XVI.C.1.a. Dharmarājikā Stūpa. Dh. ' 15-1429. St. U. 1. 1st cent. B.C.

39 828 Double pentagon bead of carnelian. XIX.A.5. Jāndiāl. Jl. ' 12-96. D. 96. 1st cent. A.D. or later.

40 829 Triangular barrel of carnelian. VIII.D.1.b. Jāndiāl. Jl. ' 12-95. D. 95. 1st cent. A.D. or later.

41 830 Club pendant of carnelian. XXII.B.2. Jāndiāl. Jl. ' 12-94. D. 94. 1st cent. A.D. or later.

42 836 Spherical carnelian. I.C.1.a. Jāndiāl. Jl. ' 12-96. D. 96. 1st cent. A.D. or later.

43 833 Oblate carnelian. I.B.1.b. Jāndiāl. Jl. ' 12-97. D. 97. 1st cent. A.D. or later.



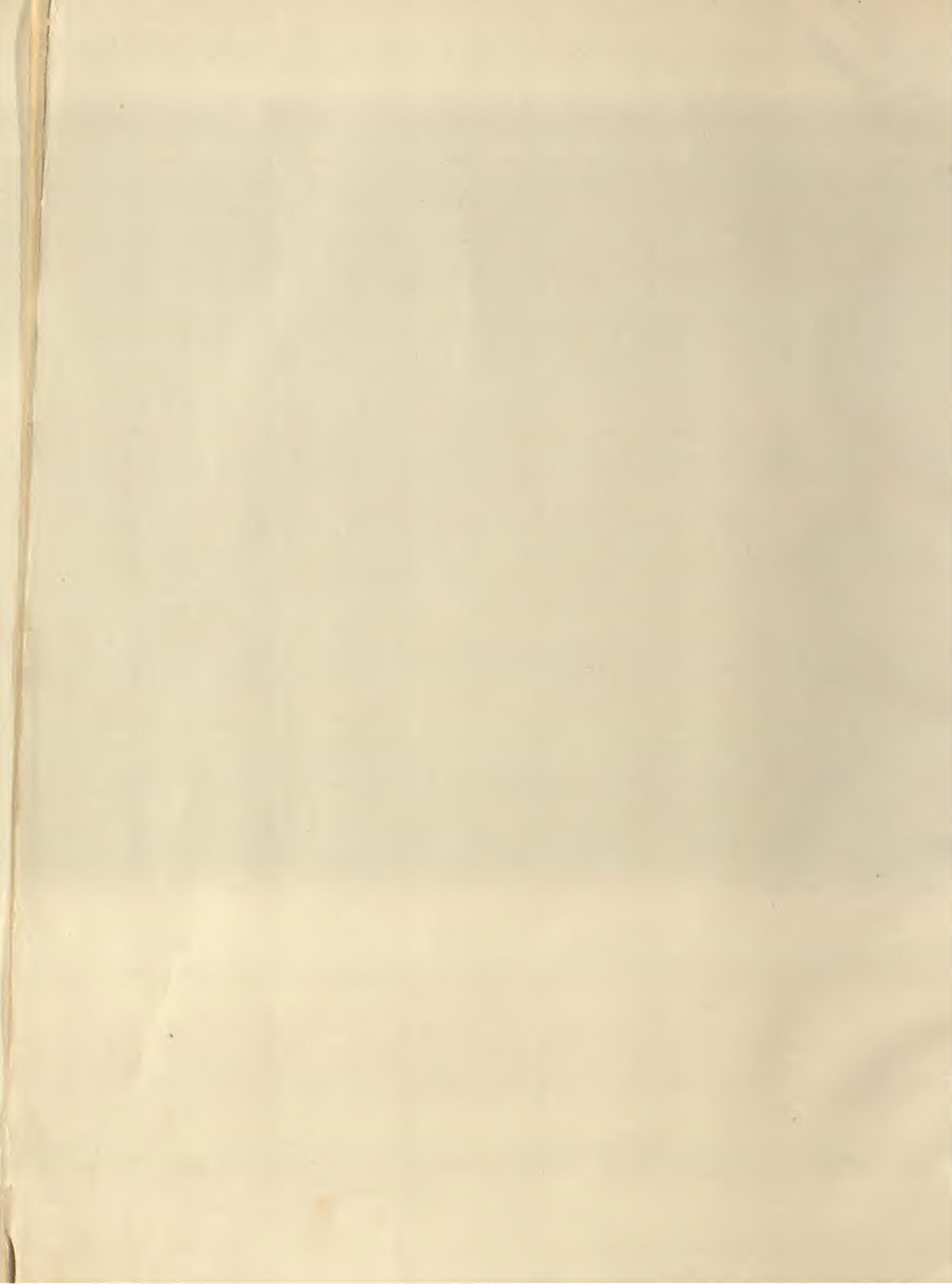


PLATE V.

1 414 Glazed quartz bead with cross hatching. XLVII.A.11. Sirkap. Sk. '20-608. Sq. 31-89'; 4' 8" b.s. 1st cent. A.D.

2 422 Glazed quartz bead with cross hatching. XLVII.A.11. Sirkap. Sk. '20-436. Sq. 90-89'; 3' 2" b.s. 1st cent. A.D.

3 444 Glazed quartz bicone bead. I.B.2.e. Sirkap. Sk. '26-2264. Sq. 102-52'; 4' b.s. 1st cent. A.D.

4 415 Glazed quartz gadrooned bead. XXIII.A.3. Sirkap. Sk. '18-2107. Sq. 107-77'; 4' b.s. 1st cent. A.D.

5 416 Vase amulet of glazed quartz. XXIX.B.13. Sirkap. Sk. '16-600. Sq. 40-88'; 4' 2" b.s. 1st cent. A.D.

6 418 Inverted drop pendant of glazed quartz. XXII.B.2. Sirkap. Sk. '19-575. Sq. 77-100'; 3' 7" b.s. 1st cent. A.D.

7 421 Drop pendant of glazed quartz. XXII.B.2. Sirkap. Sk. '24-1636. Sq. 154-69'; 3' 6" b.s. 1st cent. A.D.

8 16 Rectangular barrel of yellow quartz. X.D.1.b. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.

9 142 Plano-convex cylinder bead of quartz. V.C.2.b. Bhir Mound. Bm. '24-227. Sq. 33-61'; 2' 7" b.s. 3rd cent. B.C.

10 183 Toggle bead of milky quartz. XLII.A.5.c. Bhir Mound. Bm. '19-58. Sq. 27-59'; 3' 2" b.s. 3rd cent. B.C.

11 680 Plano-convex bicone of yellow quartz. V.B.2.f. Dharmarājikā Stūpa. Dh. '15-1429. St. U. 1. 1st cent. B.C.

12 692 Hexagonal cylinder of quartz. XIII.B.2.b. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

13 693 Convex cone disk of quartz. I.A.1.c. Dharmarājikā Stūpa. Dh. '15-1429. St. U. 1. 1st cent. B.C.

14 695 Cornerless cube of quartz. XIX.A.1. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

15 697 Toggle bead of quartz. XLII.A.5.a. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

16 698 Flattened leech bead of quartz. XLVIII.A.4. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

17 298 Lenticular cylinder bead of quartz. IV.D.2.b. Sirkap. Sk. '27-71. Spoil-earth. 1st cent. A.D. (?)

18 302 Button bead of quartz. XLII.A.6. Sirkap. Sk. '27-1621. Sq. 63-116'; 6' 8" b.s. 1st cent. A.D.

19 304 Double pentagon bead of quartz. XIX.A.5. Sirkap. Sk. '14-101. Sq. 42-74'; 6' 6" b.s. 1st cent. A.D.

20 445 Gadrooned bead of milky quartz. XXIII.A.3. Sirkap. Sk. '14-1868. Sq. 82-74'; 5' 6" b.s. 1st cent. A.D.

21 295 Barrel bead of quartz. IV.D.2.b. Sirkap. Sk. '12-1005. Sq. 65-69'; 3' 4" b.s. 1st cent. A.D.

22 297 Hexagon cylinder of quartz. XIII.D.2.b. Sirkap. Sk. '14-264. Sq. 61-78'; 2' b.s. 1st cent. A.D.

23 495 Butterfly nut bead of milky quartz glazed (?). XLVIII.A.15. Sirkap. Sk. '19-933/39. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

24 496 Butterfly nut bead of glazed quartz (?). XLVIII.A.15. Sirkap. Sk. '19-933/39.
Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

25 696 Bicone quartz. I.B.2.e. Dharmarājikā Stūpa. Dh. '13-43. St. B. 1. 1st cent.
B.C.

26 816 Rough hexagonal bead of quartz. XIII.D.2.b. Jāndiāl. Jl. '12-96. D. 95.

27 911 Hexagonal bicone of quartz. XIII.D.2.f. Lālchak. Le. '15-36. 4th to 5th
cent. A.D.

28 684 Hexagonal bicone of quartz. XIII.D.2.e. Dharmarājikā Stūpa. Dh. '15-855.
St. T. 2; 4" b.s. 1st to 4th cent. A.D.

29 293 Hexagonal bead of quartz. XIII.D.1.b. Sirkap. Sk. '14-2485. Spoil-earth.
1st cent. A.D.



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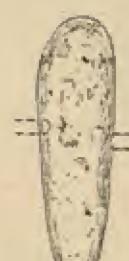
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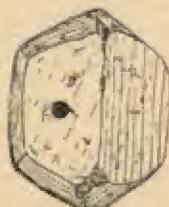
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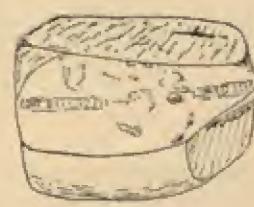
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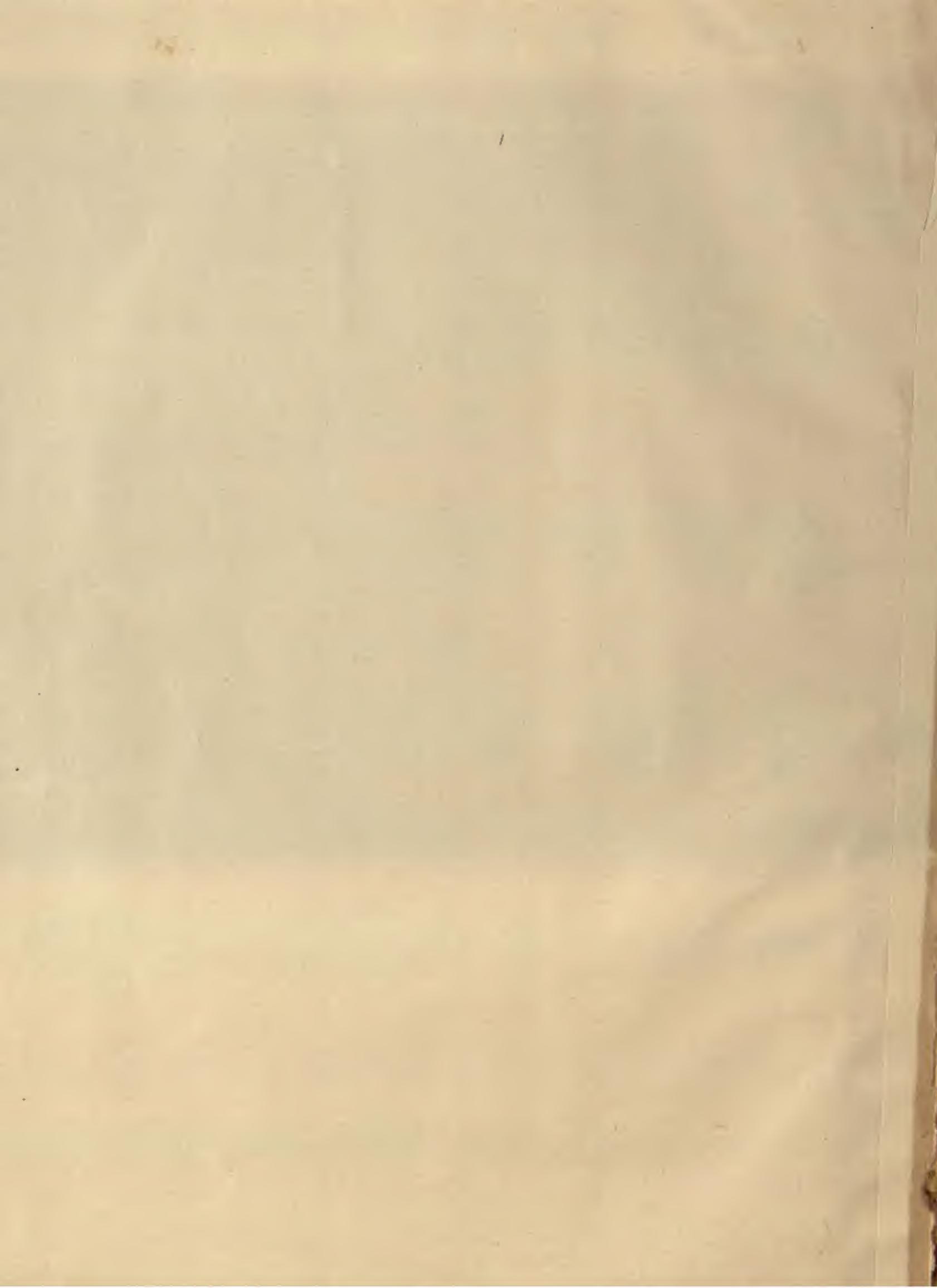


PLATE VI.

Amethyst and malachite beads.

1 10 Irregular pendant of amethyst. XXIL.B. sundry. Bhir Mound. Bm. '20-1451. Sq. 9-54'; 8' 8" b.s. 5th-4th cent. B.C.

2 1 Hexagonal barrel of amethyst. XIII.C.1.b. Bhir Mound. Bm. '24-591. Sq. 9-60'; 4' 10" b.s. 3rd cent. B.C.

3 5 Flattened hexagonal barrel of amethyst. XIII.D.1.b. Bhir Mound. Bm. '19-409. Sq. 8-46'; 2' 6" b.s. 3rd cent. B.C.

4 6 Triangular bicone of amethyst. VIII.B.1.f. Bhir Mound. Bm. '20-969. Sq. 25-26'; 3' 2" b.s. 3rd cent. B.C.

5 7 Short hexagonal barrel of amethyst. XIII.B.1.b. Bhir Mound. Bm. '19-966. Sq. 25-26'; 3' 2" b.s. 3rd cent. B.C.

6 9 Pentagonal barrel of amethyst. XII.D.2.b. Bhir Mound. Bm. '19-153. Sq. 12-30'; 3' 10" b.s. 3rd cent. B.C.

7 11 Short bicone of amethyst. I.B.2.e. Bhir Mound. Bm. '20-968. Sq. 25-26'; 3' 2" b.s. 3rd cent. B.C.

8 282 Vase pendant of amethyst. XXIX.B.15. Sirkap. Sk. '13-1216. Sq. 66-63'; 6" b.s. 1st cent. A.D.

9 283 Elliptical barrel of amethyst. II.D.1.b. Sirkap. Sk. '13-1007. Sq. 65-54'; 4" b.s. 1st cent. A.D.

10 285 Hexagonal barrel flattened of amethyst. XII.D.1.b. Sirkap. Sk. '28-1263. Spoil-earth. 1st cent. A.D. ?

11 287 Toggle hexagon of amethyst. IV.B.2.f. Sirkap. Sk. '22-714. Sq. 45-87'; 6' 8" b.s. 1st cent. A.D.

12 647 Hexagonal barrel of amethyst. XIII.D.1.b. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

13 441 Pear-shaped bead of malachite. I.D.1.g. Sirkap. Sk. '27-234. Sq. D. 24; 10' 9" b.s. 1st cent. B.C.

14 601 Vase bead of malachite. XXIX.A.15. Sirkap. Sk. '26-3540. Sq. 131-46'; 4" b.s. 1st cent. A.D.

15 916 Cylinder bead of malachite. I.C.2.b. Lālchak. Le. '15-2. 4th to 5th cent. A.D.

Lapis and granite beads.

16 19 Square cylinder bead of lapis-lazuli. IX.D.2.b. Bhir Mound Bm. '19-1434. Sq. 13-23'; 11' 6" b.s. 5th cent. B.C.

17 22 Square bicone bead of lapis-lazuli. IX.B.2.f. Bhir Mound. Bm. '19-1412. Sq. 10-40'; 10' b.s. 5th cent. B.C.

18 20 Hexagonal barrel bead of lapis-lazuli. XIII.D.1.b. Bhir Mound. Bm. '21-712. Sq. 47-72'; 6' 10" b.s. 4th cent. B.C.

19 24 Drop pendant lapis-lazuli. XXII.B.2. Bhir Mound. Bm. '20-32. Sq. 33-34'; 1' 8" b.s. 3rd cent. B.C.

20 409 Barrel bead of lapis with collars. I.D.1.b. Sirkap. Sk. '28-2676. Sq. 174-38'; 4' 6" b.s. 1st cent. A.D.

21 406 Convex cone bead of lapis-lazuli. I.A.1.c. Sirkap. Sk. '14-1686. Spoil-earth. 1st cent. A.D.

22 640 Segmented bead of lapis-lazuli. XVII.A.1.a. Sirkap. Sk. '22-115. Sq. 12-86'; 1' 6" b.s. 1st cent. A.D.

23 404 Vase bead of lapis-lazuli. XXIX.A.15. Sirkap. Sk. '25-443. Sq. 13-98'; 6' 3" b.s. 1st cent. A.D.

24 735 Oval barrel bead of lapis-lazuli. II.B.1.b. Dharmarājikā Stūpa. Dh. '16-391. St. T. 2; 2' 6" b.s. 1st to 4th cent. A.D.

25 812 Pendant of lapis-lazuli. XXII.B.2. Jāṇḍiāl. Jl. '12-96. D. 96. 1st cent. A.D. or later.

26 447 Drop pendant of granite. XXII.B.2. Sirkap. Sk. '19-1398. Sq. 58-109'; 4" b.s. 1st cent. A.D.

27 181 Scaraboid of black granite. V.D.1.b. Bhir Mound. Bm. '19-370. Sq. 15-18'; 2' 10" b.s. 3rd cent. B.C.

Garnet beads.

28 145 Spacing bead of garnet. XVII.A.2. Bhir Mound. Bm. '21-984. Sq. 16-63'; 1' 11" b.s. 3rd cent. B.C.

29 148 Lenticular spherical bead of garnet. IV.C.1.a. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.

30 313 Lozenge hexagon bead of garnet. XIX.A.8.b. Sirkap. Sk. '26-438. Spoil-earth. 1st cent. A.D.

31 312 Hexagonal bicone bead of garnet. XIII.B.2.e. Sirkap. Sk. '14-1613. Sq. 70-67'; 2" b.s. 1st cent. A.D.

32 648 Hexagonal barrel bead of garnet. XIII.B.1.b. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

33 659 Triratna of garnet. XXIX.A.23. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

34 656 Toggle bead of garnet. XLII.A.5.a. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

Jasper beads.

35 126 Barrel bead with zones of green jasper. I.D.1.b. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.

36 127 Barrel bead with zones of green jasper. I.D.1.b. Bhir Mound. Bm. '20-735. Spoil-earth. 3rd cent. B.C.

37 130 Double hexagon bead of green jasper. XIX.A.6. Bhir Mound. Bm. '21-458. Sq. 26-14'; 3' 4" b.s. 3rd cent. B.C.

38 431 Pentagonal bicone of green jasper. XII.B.2.f. Sirkap. Sk. '19-933/41. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

39 427 Pentagonal barrel of green jasper. XII.B.1.b. Sirkap. Sk. '19-933/41. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

40 681 Icohexahedron with square and triangular surfaces of green jasper. XIX.A.9. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.

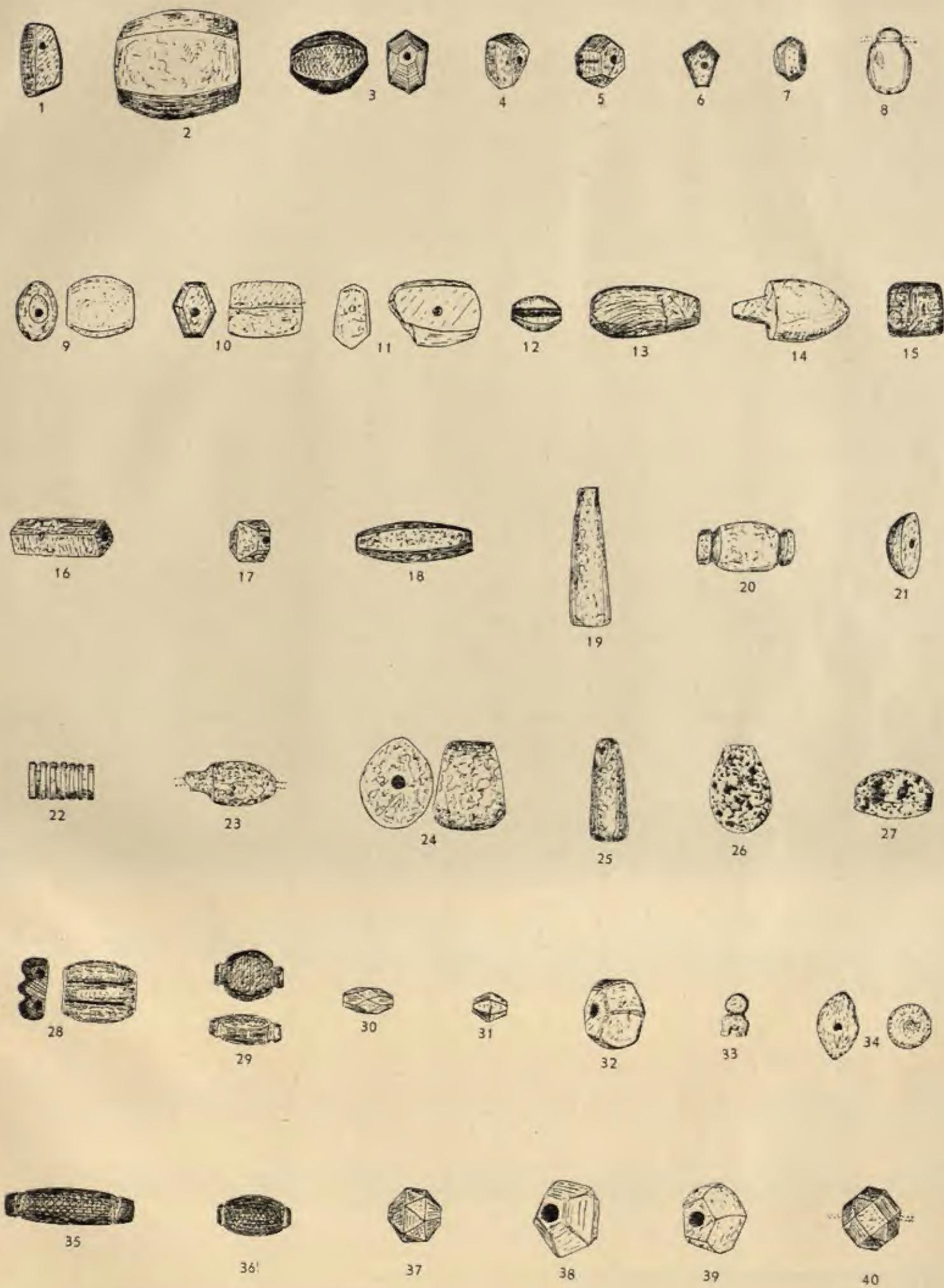


PLATE VII.

- 1 136 Headless human figure of chalcedony. XXX. Bhir Mound. Bm. '24-266. Sq. 35-32'; 2' 6" b.s. 3rd cent. B.C.
- 2 771 Monkey amulet of faience. XXXII.B.2. Dharmarājikā Stūpa. Dh. '15-1429. St. U. 1. 1st cent. B.C.
- 3 333 Lion bead of carnelian. XXXII.A.18. Sirkap. Sk. '19-693. Sq. 42-52'; 7' 3" b.s. 1st cent. A.D.
- 4 408 Lion bead of lapis-lazuli. XXXII.A.18. Sirkap. Sk. '20-361. Sq. 38-89'; 3' 8" b.s. 1st cent. A.D.
- 5 412 Lion bead of glazed quartz. XXXII.A.18. Sirkap. Sk. '26-3762. Sq. 84-48'; 10' 3" b.s. 1st cent. B.C.
- 6 643 Lion bead of glazed quartz. XXXII.A.18. Sirkap. Sk. '13-40. Block G. 1st cent. A.D.
- 7 650 Lion bead of garnet. XXXII.A.18. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.
- 8 651 Lion bead of garnet. XXXII.A.18. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.
- 9 86 Bull pendant of carnelian. XXXII.B.5. Bhir Mound. Bm. '19-1939. Sq. 28-13'; 3' 2" b.s. 3rd cent. B.C.
- 10 642 Ram bead of carnelian. XXXII.A.21. Sirkap. Sk. '13-40. Block G. 1st cent. A.D.
- 11 614 Elephant bead of steatite. XXXII.A.10. Sirkap. Sk. '13-1. Purchased. 1st cent. A.D. (?)
- 12 890 Elephant bead of carnelian. XXXII.A.10. Sirsukh. Ss. '15-19. South of Ss. 3rd to 4th cent. A.D.
- 13 343 Dog's head bead (?) of carnelian. XXV.A.1.e. Sirkap. Sk. '29-1900. Sq. 65-91'; 3' b.s. 1st cent. A.D.
- 14 81 Bird on tree of carnelian. XXX. sundry. Bhir Mound. Bm. '20-974. Sq. 25-20'; 3' 2" b.s. 3rd cent. B.C.
- 15 368 Crow bead of agate. XXXIII.A.sun. Sirkap. Sk. '16-931. Sq. 37-60'; 2' b.s. 1st cent. A.D.
- 16 135 Duck bead of chalcedony. XXXIII.A.1. Bhir Mound. Bm. '19-243. Sq. 25-59'; 10' 8" b.s. 5th cent. B.C.
- 17 653 Bird bead of garnet. XXXIII.sun. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6; 8' 8" b.s. 1st cent. B.C.
- 18 504 Cock bead of bone (?). XXXIII.A.10. Sirkap. Sk. '13-503. Sq. 90-59'; 5' 6" b.s. 1st cent. A.D.
- 19 739 Bird bead of shell. XXXIII.A.10. Dharmarājikā Stūpa. Dh. '14-1870. Debris. 1st to 5th cent. A.D.
- 20 792 Bird bead of green glass. XXXIII.sun. Dharmarājikā Stūpa. Dh. '16-981. Debris. 1st to 5th cent. A.D.
- 21 497 Bird pendant of faience. XXXIII.sun. Sirkap. Sk. '19-933/39. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.
- 22 420 Tortoise bead of glazed quartz. XXXIV.A.5. Sirkap. Sk. '19-786. Sq. 59-115'; 4' 2" b.s. 1st cent. A.D.
- 23 617 Tortoise bead of green faience. XXXIV.A.5. Sirkap. Sk. '15-725. Sq. 37-53'; 2' b.s. 1st cent. A.D.

24 618 Tortoise bead of faience. XXXIV.A.5. Sirkap. Sk. '27-582. Sq. 73-90'; 6' 6"
b.s. 1st cent. A.D.

25 652 Tortoise bead of garnet. XXXIV.A.5. Dharmarājikā Stūpa. Dh. '14-587. St.
B. 6. 8' 8" b.s. 1st cent. B.C.

26 758 Tortoise bead of mother-of-pearl. XXXIV.A.5. Dharmarājikā Stūpa. Dh. '15-
1429. St. U. 1. 1st cent. B.C.

27 369 Frog bead of agate. XXXIV.A.3. Sirkap. Sk. '28-137. Sq. 25-88'; 5' b.s.
1st cent. A.D.

28 419 Frog (?) bead of glazed quartz. XXXIV.A.3. Sirkap. Sk. '13-1. Purchased,
1st cent. A.D. (?)

29 690 Frog bead of glazed quartz. XXXIV.A.3. Dharmarājikā Stūpa. Dh. '14-587.
St. B. 6. 8' 8" b.s. 1st cent. B.C.

30 649 Frog bead of garnet. XXXIV.A.3. Dharmarājikā Stūpa. Dh. '14-587. St.
B. 6. 8' 8" b.s. 1st cent. B.C.

31 646 Frog bead of amethyst. XXXIV.A.3. Dharmarājikā Stūpa. Dh. '14-587. St.
B. 6. 8' 8" b.s. 1st cent. B.C.

32 740 Frog (?) pendant of shell. XXXIV.A.3. Dharmarājikā Stūpa. Dh. '15-624.
Mon. S. 2. 4' b.s. 1st—5th cent. A.D.

33 864 Frog pendant of shell. XXXIV.A.3. Jaṇḍiāl. Jl. '12-75. D. 75. 1st cent.
A.D. or later.

34 810 Beetle (?) bead of lapis-lazuli. XXXIV.A.9. Jaṇḍiāl. Jl. '12-97. D. 97. 1st
cent. A. D. or later.

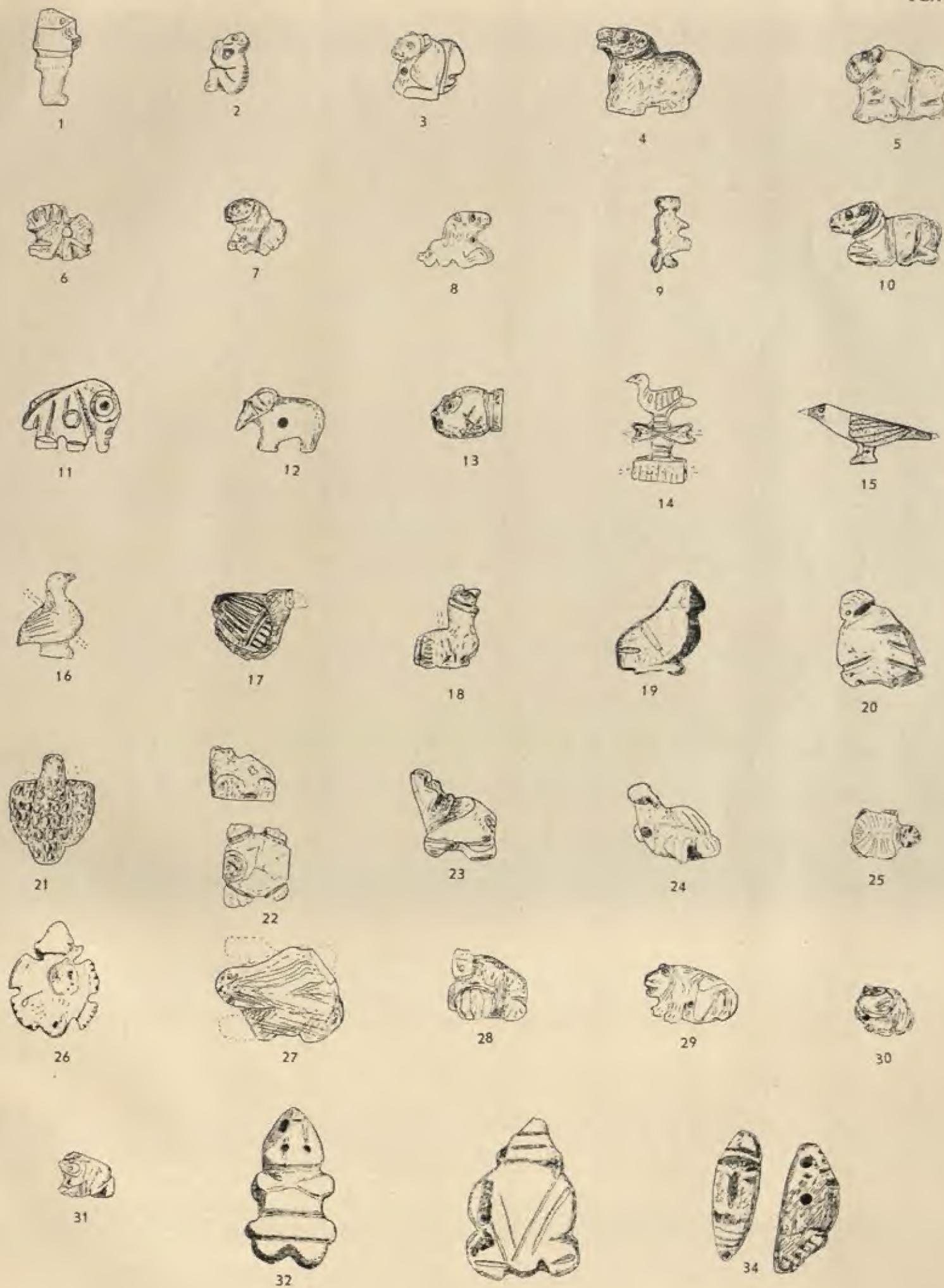


PLATE VIII.

Shell beads.

1 204 Irregular barrel of shell. V.D.2.b. Bhir Mound. Bm. '19-1645. Sq. 59-5'; 12' 11" b.s. 6th—7th cent. B.C.

2 216 Drop pendant of shell. XXII.B.2. Bhir Mound. Bm. '21-106. Sq. 11-52'; 6" b.s. 4th cent. B.C.

3 170 Pendant of shell. XXII.B.7. Bhir Mound. Bm. '19-230. Sq. 6-60'; 4" b.s. 3rd cent. B.C.

4 206 Bud-shape pendant of shell. XXII.B.7. Bhir Mound. Bm. '21-400. Sq. 28-61'; 4' 10" b.s. 3rd cent. B.C.

5 195 Square bicone bead of shell. IX.B.2.f. Bhir Mound. Bm. '21-560. Sq. F. 51'; 4' 5" b.s. 3rd cent. B.C.

6 200 Barrel bead with collars. I.B.2.b. Bhir Mound. Bm. '20-933. Sq. 29-51'; 3' 10" b.s. 3rd cent. B.C.

7 208 Triratna of shell. XIX.B.23. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.

8 210 Interlocked bicones. XXIX.A.sun. Bhir Mound. Bm. '12-20/12. 3rd cent. B.C.

9 214 Spacing bead of shell. XVII.A.3. Bhir Mound. Bm. '19-282. Sq. 15-11'; 4' 5" b.s. 3rd cent. B.C.

10 222 Cross bead of shell. XXIX.A.1. Bhir Mound. Bm. '20-1058. Sq. 23-27'; 4' 3" b.s. 3rd cent. B.C.

11 463 Tabular bicone bead of shell. XVI.D.2.f. Sirkap. Sk. '28-1637. Sq. 65-115'; 7" b.s. 1st cent. A.D.

12 464 Dumb-bell spacing bead of shell. XVII.A.3. Sirkap. Sk. '13-1228. Sq. 72-62'; 6' 9" b.s. 1st cent. A.D.

13 465 Imitation cowry of shell. XXVII.B.2. Sirkap. Sk. '13-1228. Sq. 72-62'; 6' 9" b.s. 1st cent. A.D.

14 466 Flat drop-pendant of shell. XXII.B.2. Sirkap. Sk. '28-2. Sq. 24-50'; surface. 1st cent. A.D.

15 468 Rectangular circular bead of shell. X.B.1.b. Sirkap. Sk. '20-713. Sq. 26-80'; 5' 6" b.s. 1st cent. A.D.

16 476 Button bead of shell with V-perforation. XLII.A.2. Sirkap. Sk. '17-725. Sq. 106-57'; 11' 6" b.s. 1st cent. B.C.

17 478 Drop pendant of shell. XXII.B.2. Sirkap. Sk. '22-517. Spoil-earth. 1st cent. A.D.

18 479 Double drop pendant of shell. XXII.B.8. Sirkap. Sk. '19-56. Sq. 16-99'; 2' 8" b.s. 1st cent. A.D.

19 483 Spacing-bead of shell. XLVI.A.4., XVII.A.3. Sirkap. Sk. '26-4084. 1st cent. A.D.

20 485 Spacing bead of shell. XVII.A.3. Sirkap. Sk. '12-466. Sq. 110-68'; 3" b.s. 1st cent. A.D.

21 489 Spacing bead of shell. XVII.A.3. Sirkap. Sk. '28-1478. Sq. 54-104'. 1st cent. A.D.

22 492 Leaf shaped pendant of shell. XXII.B.sun. Sirkap. Sk. '13-508. Sq. 90-59'; 5' 6" b.s. 1st cent. A.D.

23 491 Tabular circular bead of shell. XLVIII. sundry. Sirkap. Sk. '16-671. Spoil-earth. 1st cent. A.D. (?)

24 493 Corinthian capital bead of shell. XXIX.A.25. Sirkap. Sk. '13-387. Sq. 51-77'; 3' b.s. 1st cent. A.D.

25 751 Bell pendant of shell. XXIX.B.14. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

26 756 Double-axe bead of shell. XXVIII.A.1. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

27 760 Stepped spacing bead of shell. XVII.A.3. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

28 761 Spacing bead of shell. XVII.A.3. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

29 741 Spacing bead of shell. XLVI.A.4., XVII.A.3. Dharmarājikā Stūpa. Dh. '13-1190. St. D. 6. 7' b.s. 1st cent. A.D.

30 752 Rectangular spacing bead of shell. XLVI.A.4., XVII.A.3. Dharmarājikā Stūpa. Dh. '13-1621. St. G. 4. 2' 6" b.s. 1st cent. A.D.

31 754 Star bead of shell. XXIX.A.19. Dharmarājikā Stūpa. Dh. '13-1621. St. G. 4. 2' 6" b.s. 1st cent. A.D.

32 749 Toggle bead of shell. XLII.A.5. Dharmarājikā Stūpa. Dh. '15-1501. E. of N. 9. Debris. 4th cent. A.D. (?)

33 742 Spacing bead of shell. XLVI.A.4., XVII.A.3. Dharmarājikā Stūpa. Dh. '17-182. Debris. 1st—5th cent. A.D.

34 794 Short barrel bead of black shell. I.B.2.b. Dharmarājikā Stūpa. Dh. '16-634. Court-yard. 1' 6" b.s. 1st—5th cent. A.D.

35 870 Drop pendant of shell. XXII.B.2. Jāndiāl. Jl. '12-95. D. 95. 1st cent. A.D. or later.

36 872 Wedge-shaped barrel bead of shell. II.B.1.b. Jāndiāl. Jl. '12-96. D. 96. 1st cent. A.D. or later.

37 878 Leech bead of shell. XLVIII.A.12. Jāndiāl. Jl. '12-96. D. 96. 1st cent. A.D. or later.

38 895 Spacing bead of shell. XXVIII.B.5., XVII.A.3. Sirsukh. Ss. '15-5. 2' b.s. 3rd—4th cent. A.D.

39 896 Spacing bead of shell. XXIX.A.24. Sirsukh. Ss. '15-23. 2' b.s. 3rd—4th cent. A.D.

40 919 Wedge-shaped barrel bead of black shell. II.C.1.b. Bhallar Tope. Bh. '14-4. 2' 2" b.s. 4th—5th cent. A.D.

41 477 Pusiotema mendicaria. XXVII.B. Sirkap. Sk. '13-389. Sq. 93-57'; 5' b.s. 1st cent. A.D.

42 738 Pyrene flava. XXVII.A. Dharmarājikā Stūpa. Dh. '17-51. 2' b.s. 1st—4th cent. A.D.

43 762 Pearl shell. XXVII.B. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

44 918 Pearl with ground ends. I.B.1.b. Lālchak. Le. '15-2. 4th—5th cent. A.D.

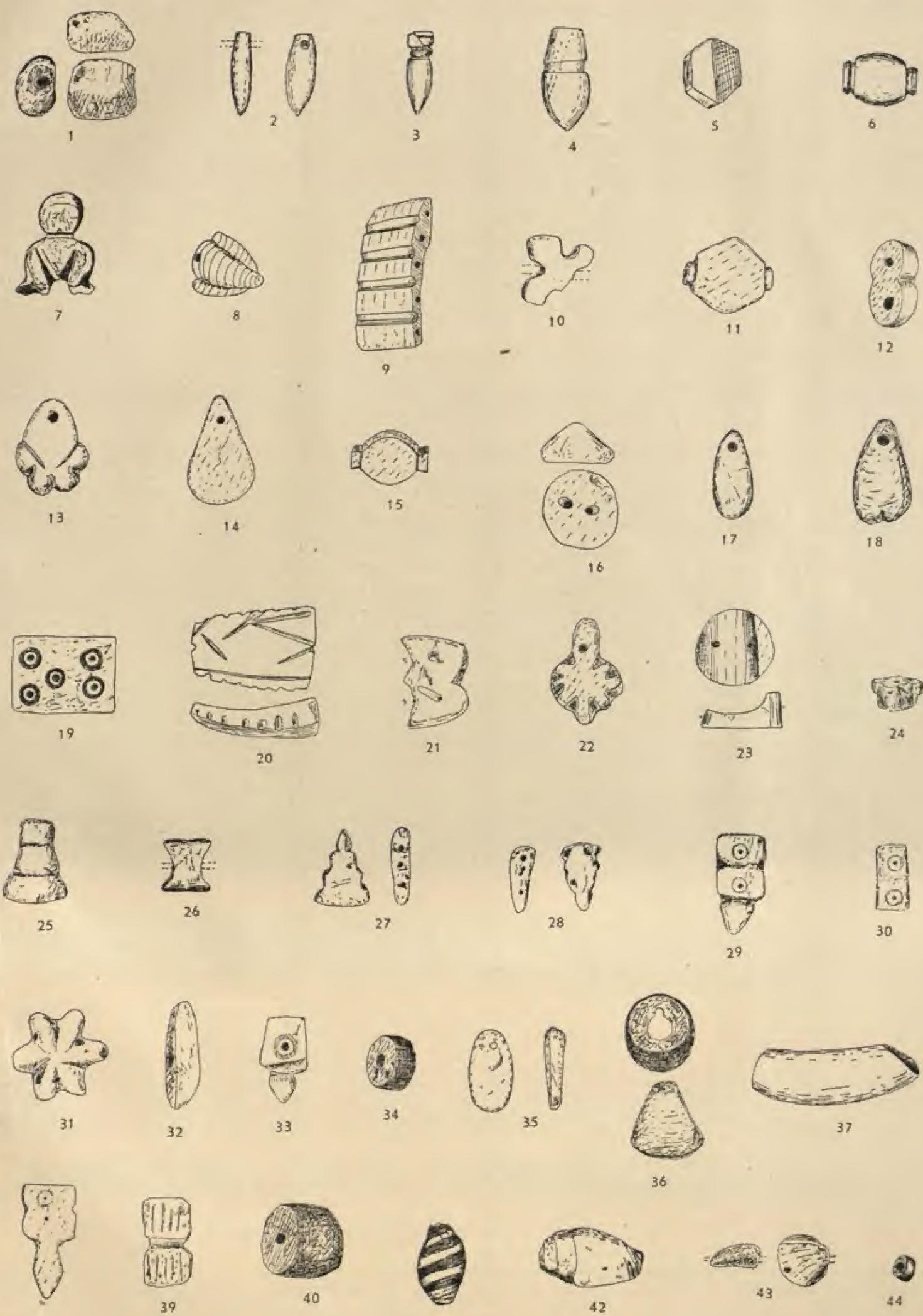


PLATE IX.

Glass.

- 1 231 Inverted flower pendant; white glass. XXVI. sundry. Bhir Mound. Bm. '20-1055. Sq. 28-30'; 4' 5" b.s. 3rd cent. B.C.
- 2 239 Spiral bead of black and white glass. XVIII.A.3. Bhir Mound. Bm. '21-1456. Sq. 42-72'; 4' 5" b.s. 3rd cent. B.C.
- 3 241 Hexagon barrel of green glass. XIII.D.1.b. Bhir Mound. Bm. '20-1335. Sq. 28-27'; 5' 6" b.s. 4th-3rd cent. B.C.
- 4 245 Ball pendant of blue glass. XXII.B.1. Bhir Mound. Bm. '19-1040. Sq. 12-24'; 8' 4" b.s. 5th—4th cent. B.C.
- 5 251 Club pendant of green glass. XXII.B.2. Bhir Mound. Bm. '19-411. Sq. 8-45'; 4' 6" b.s. 3rd cent. B.C.
- 6 252 Flattened drop pendant of green glass. XXII.B.3. Bhir Mound. Bm. '19-1555. Sq. 49-8'; 7' b.s. 4th cent. B.C.
- 7 253 Bud pendant of green glass. XXII.B.7. Bhir Mound. Bm. '19-1986. Sq. 8-46'; 8' b.s. 4th cent. B.C.
- 8 255 Folded bead of copper glass. I.C.2.e. Bhir Mound. Bm. '20-20. Sq. 33-64'; 1' 2" b.s. 3rd cent. B.C.
- 9 258 Pyramid pendant of amber glass. XXII.B.4.a. Bhir Mound. Bm. '19-473. Sq. 8-43'; 4' 6" b.s. 3rd cent. B.C.
- 10 261 Broken ball pendant of iridescent glass. XXII.B.1. Bhir Mound. Bm. '20-2022. Sq. 28-13'; 9' 4" b.s. 6th—5th cent. B.C.
- 11 270 Cornerless cube bead of green glass. XIX.A.1. Bhir Mound. Bm. '19-201. Sq. 8-45'; 3' 3" b.s. 3rd cent. B.C.
- 12 512 Hexagon cylinder variegated glass. XIII.D.2.b. Sirkap. Sk. '26-2050. Sq. 118-53'; 3' 6" b.s. 1st cent. A.D.
- 13 527 Twisted glass bead, blue and yellow. XVIII.Br.1a.2. Sirkap. Sk. '27-1700. Sq. 63-116'; 10' 10" b.s. 1st cent. B.C.
- 14 530 Tabular circular bead of transparent glass. XVI.D.1.b. Sirkap. Sk. '29-2800. Sq. 93-51'; 1' 5" b.s. 1st cent. A.D.
- 15 536 Gadrooned cylinder of iridescent glass. XXIII.A.3. Sirkap. Sk. '20-555. Sq. 33-88'; 3' 7" b.s. 1st cent. A.D.
- 16 544 Bicone of variegated glass. I.B.2.f. Sirkap. Sk. '19-418. Sq. 88-98'; 3' 3" b.s. 1st cent. A.D.
- 17 570 Segmented cane bead of blue glass. XVII.A.1.a. Sirkap. Sk. '24-1148. Sq. 50-51'; 3' 6" b.s. 1st cent. A.D.
- 18 572 Spacing bead of copper blue glass. XVII.A.3. Sirkap. Sk. '26-4601. Sq. 177-29'; 7' 4" b.s. 1st cent. A.D.
- 19 574 Circular hollow bead with loose INNER layer. I.B.1.a. Sirkap. Sk. '13-39. Sq. 56-59'; 2' b.s. 1st cent. A.D.
- 20 578 Gadrooned bead of iridescent glass. XXIII.A.3. Sirkap. Sk. '20-524. Sq. 89-108'. 1st cent. A.D.
- 21 593 Cornerless cube bead of pale green glass. XIX.A.1. Sirkap. Sk. '13-26. Sq. 48-65'; 6' 4" b.s. 1st cent. A.D.
- 22 594 Drop pendant of pale green glass. XXII.B.2. Sirkap. Sk. '24-4. Spoil-earth. 1st cent. A.D.

23 596 Imitation amulet-case of cuprous oxide glass. XXIX.A.13. Sirkap. Sk. '19-933/41. Sq. 57-114'; 5' 6" b.s. 1st cent. A.D.

24 597 Gadrooned pear-shaped bead of red glass. XXIII.A.3. Sirkap. Sk. '14-2166. Sq. 42-74'; 9' 8" b.s. 1st cent. B.C.

25 598 Vase pendant of green glass. XXIX.B.15. Sirkap. Sk. '14-1613. Sq. 70-67'; 2' b.s. 1st cent. A.D.

26 599 Drop pendant of amber glass. XXII.B.7. Sirkap. Sk. '20-80. Palace. 1' 9" b.s. 1st cent. A.D.

27 600 Axe pendant of variegated glass. XXVIII.B.1. Sirkap. Sk. '28-2132. Sq. 117-81'; 5' 9" b.s. 1st cent. A.D.

28 602 Ball pendant of yellow glass. XXII.B.1. Sirkap. Sk. '14-923. Sq. 49-79'; 2' 5" b.s. 1st cent. A.D.

29 605 Folded zone bead of cobalt blue and white glass. XLVII.A.1. Sirkap. Sk. '12-960. Sq. 42-65'; 6' b.s. 1st cent. A.D.

30 609 Eye bead of blue and yellow glass. XLVI.A.sundry. Sirkap. Sk. '16-1051. Sq. 38-61'; 3' 6" b.s. 1st cent. A.D.

31 612 Spiral bead of black and white (?) glass. XVIII.A.3. Sirkap. Sk. '16-777. Sq. 16-57'; 1' 6" b.s. 1st cent. A.D.

32 732 Tetrahedron of cobalt glass. XIX.A.2. Dharmarājikā. Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

33 780 Segmented cane bead of blue glass. XVII.A.1.a. Dharmarājikā Stūpa. Dh. '13-1371. 1st—5th cent. A.D.

34 781 Segmented bead of amber coloured glass. XVII.A.1.a. Dharmarājikā Stūpa. Dh. '15-924. St. T. 2. 13' b.s. 1st—4th cent. A.D.

35 786 Vase bead of corroded white glass. XXIX.A.15. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

36 787 Pendant of yellow or amber glass. XXIX.B.14. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

37 788 Chamfered cylinder with collar (cornerless cube ?). XIX.A.1. Dharmarājikā Stūpa. Dh. '15-1429. St. U. 1. 1st cent. B.C.

38 791 Twisted cylinder of variegated glass. XVIII.A.3. Dharmarājikā Stūpa. Dh. '13-568. St. H. 1; 3' 7" b.s. 1st cent. A.D.

39 848 Imitation agate square cylinder. IX.C.2.b. Jāndiāl. Jl. '12-78. D. 78. 1st—5th cent. A.D.

40 861 Moulded spacing bead of black glass, gilt. XVII.A.3. Jāndiāl. Jl. '12-97. D. 97. 1st to 5th cent. A.D.

41 900 Segmented bead of blue glass. XVII.A.1.a. Sirsukh. Ss. '15-49. 3rd—4th cent. A.D.



PLATE X.

- 1 615 Fist amulet of green faience, XXXI.B.5. Sirkap. Sk. '22-492. Sq. 52-94'; 5' 2" b.s. 1st cent. A.D.
- 2 619 Granulated bead of faience. XXV.A.5. Sirkap. Sk. '15-725. Sq. 37-53'; 2" b.s. 1st cent. A.D.
- 3 620 Granulated bead of faience. XXV.A.5. Sirkap. Sk. '20-361. Sq. 38-89'; 3' 8" b.s. 1st cent. A.D.
- 4 625 Irregular rayed bead of faience. XXIII.A.1.c. Sirkap. Sk. '19-1391. Sq. 56-113'; 4' 2" b.s. 1st cent. A.D.
- 5 626 Double crescent spacing bead of faience. XVII.A.3. Sirkap. Sk. '15-939. Sq. 38-73'; 3' b.s. 1st cent. A.D.
- 6 627 Double crescent spacing bead of faience. XVII.A.3. Sirkap. Sk. '28-1473. Sq. 56-104'; 3' b.s. 1st cent. A.D.
- 7 808 Gadrooned bead of faience. Dharmarājikā Stūpa. Dh. '15-942. St. T. 2. 4' 6" b.s. 1st—5th cent. A.D.
- 8 277 Square barrel bead of pottery. IX.D.1.b. Bhir Mound. Bm. '20-1191. Sq. 28-29'; 4' 4" b.s. 3rd cent. B.C.
- 9 274 Panel bead of pottery. XLVIII.A.2.a. Bhir Mound. Bm. '24-115. Sq. 21-61'; 5' b.s. 3rd cent. B.C.
- 10 273 Barrel bead of pottery. I.D.1.b. Bhir Mound. Bm. '20-599. Sq. 34-27'; 3' 1" b.s. 3rd cent. B.C.
- 11 631 Vase amulet of pottery. XXIX.A.15. Sirkap. Sk. '20-292a. Spoil-earth. 1st cent. A.D. (?)
- 12 863 Moulded bead of bitumen (?). XXIII.A.3. Jāṇḍiāl. Jl. '12-94. D. 94. 1st cent. A.D. or later.
- 13 877 Barrel bead of bone with collars. I.D.1.b. Jāṇḍiāl. Jl. '12-80. D. 80. 1st cent. A.D. or later.
- 14 505 Triratna of ivory. XXIX.B.23. Sirkap. Sk. '13-538. Sq. 109-57'; 2' 8" b.s. 1st cent. A.D.
- 15 481 Shell spacing bead. XVII.A.3. Sirkap. Sk. '24-1273. Sq. 48-49'; 5' b.s. 1st cent. A.D.
- 16 480 Spacing bead of shell. XVII.A.3. Sirkap. Sk. '12-960. Sq. 42-65'; 6" b.s. 1st cent. A.D.
- 17 218 Barrel bead of bone with collars. I.D.1.b. Bhir Mound. Bm. '19-1621. Sq. 9-43'; 5' 9" b.s. 4th cent. B.C.
- 18 217 Oblate bead of bone. I.B.1.a. Bhir Mound. Bm. '21-106. Sq. 11-52'; 6" b.s. 4th—3rd cent. B.C.
- 19 700 Hexagon barrel of beryl. XIII.C.1.b. Dharmarājikā Stūpa. Dh. '15-1429. St. U. 1. 1st cent. B.C.
- 20 912 Barrel bead of white limestone. II.D.2.b. Lālchak. Lc. '15-27. 4" b.s. 4th to 5th cent. A.D.
- 21 750 Elliptical oblate bead of white limestone. II.B.2.b. Dharmarājikā Stūpa. Dh. '16-245. Mon. S. 2' 9" b.s. 1st—5th cent. A.D.
- 22 449 Truncated pyramid bead of limestone. XLVIII.A.13. Sirkap. Sk. '19-933/41. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.
- 23 450 Hexagon cylinder, flattened, of limestone. XIII.D.2.b. Sirkap. Sk. '19-933/41. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

24 381 Comb (?) bead of steatite. XXIX.A.24. Sirkap. Sk. '12-744. Sq. 50-69'; 10' b.s. 1st cent. B.C.

25 382 Mitre bead of red serpentine. XXIX.A.sundry. Sirkap. Sk. '19-933/60. Sq. 59-114'; 5' 6" b.s. 1st cent. A.D.

26 438 Rectangular cylinder with collars of blue serpentine (?). X.D.2.b. Sirkap. Sk. '22-412. Sq. 11-93'; 7' 9" b.s. 1st cent. A.D.

27 439 Ball pendant of blue serpentine. XXII.B.2. Sirkap. Sk. '20-114. Sq. 55-82'; 3' b.s. 1st cent. A.D.

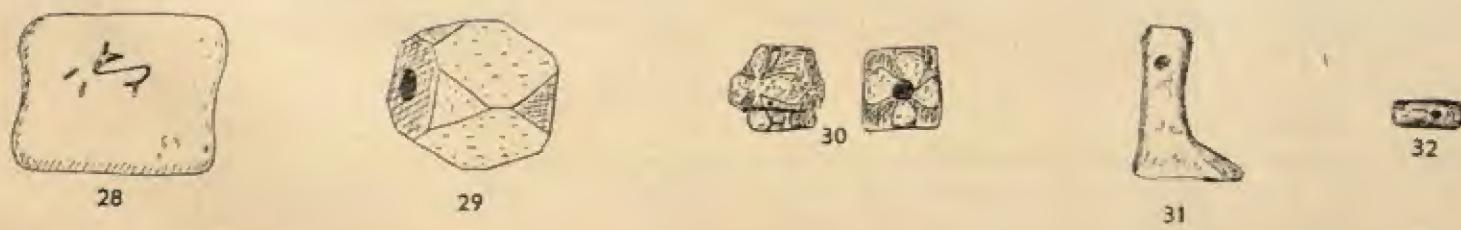
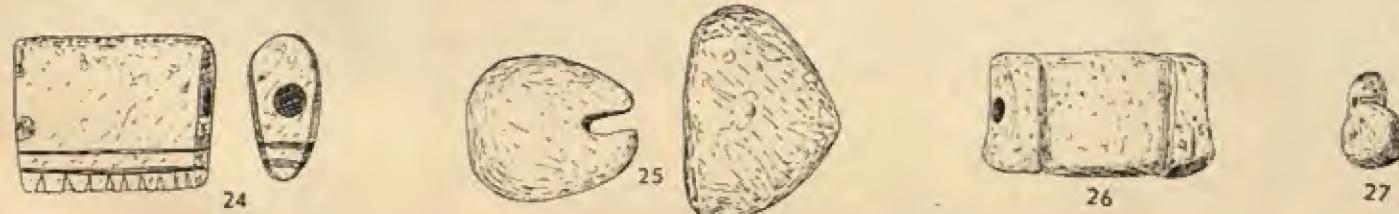
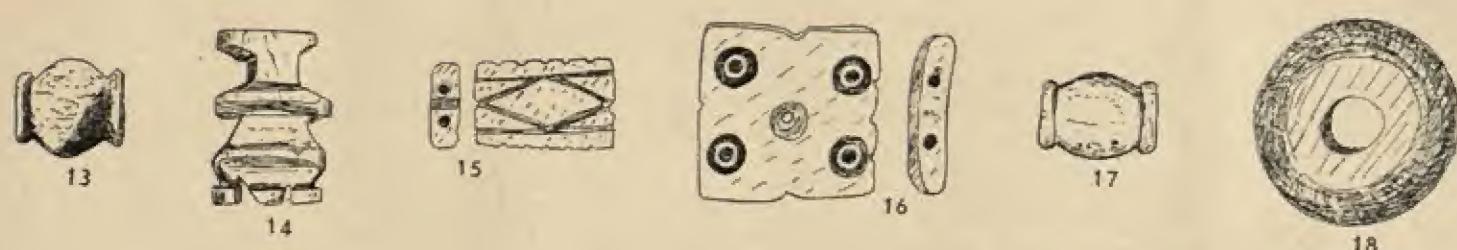
28 453 Rectangular cylinder of siliceous shale. X.D.2.b. Sirkap. Sk. '28-662. Sq. 67-99'; 4' b.s. 1st cent. A.D.

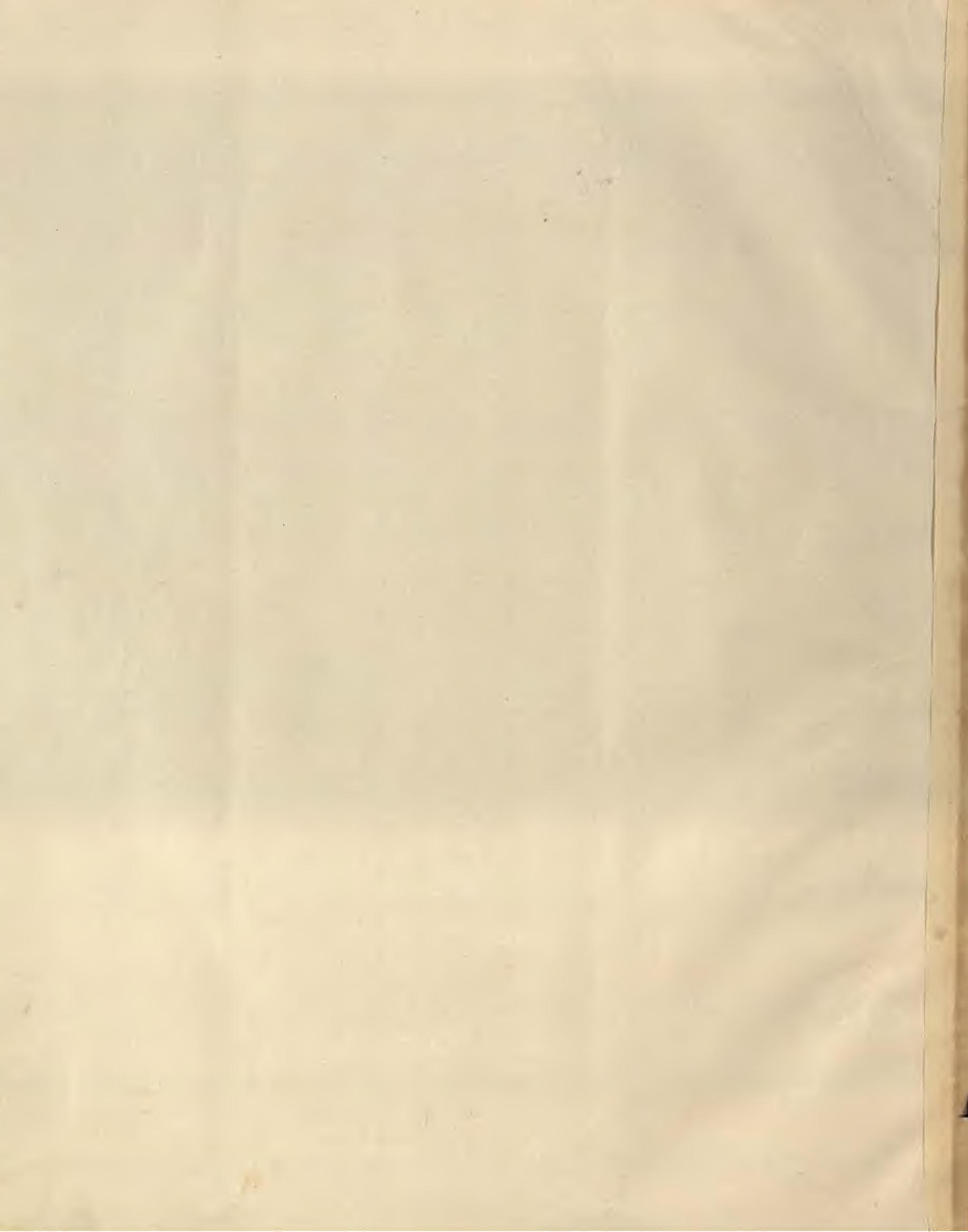
29 728 Cornerless cube of sedimentary shale. XIX.A.1. Dharmarājikā Stūpa. Dh. '15-1458. Mon. T. 2. 6' b.s. 1st to 5th cent. A.D.

30 610 Cross bead of jet(?). XXIX.A.1. Sirkap. Sk. '28-1332. Sq. 63-96'; 3' 6" b.s. 1st cent. A.D.

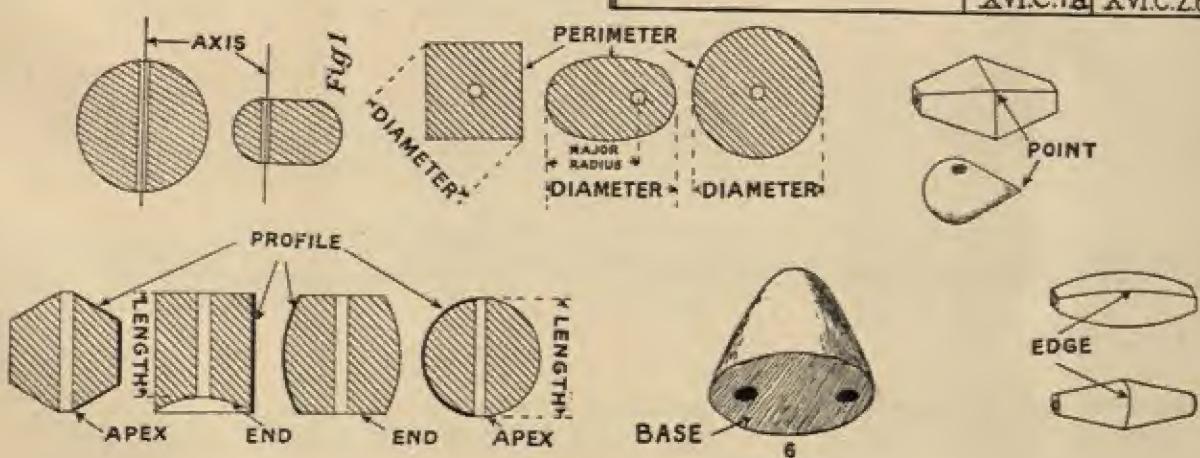
31 763 Foot amulet of coral. XXXI.B.4. Dharmarājikā Stūpa. Dh. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.

32 767 Toggle bead of coral. XLII.A.5. Dharmarājikā Stūpa. Db. '14-587. St. B. 6. 8' 8" b.s. 1st cent. B.C.





SUBDIVISION I. ROUNDED BEADS.				SUBDIVISION II. FACETED BEADS.			
Groups V, VI and VII have one flat surface.				Longitudinal Section.		Transverse Section.	
Longitudinal Section.							
Transverse Section.							
Group I Circular.							
	I.C.1.a.	I.C.2.b.	I.C.2.e.				
Group II Elliptical.							
	II.C.1.a.	II.C.2.b.	II.C.2.e.				
Group III Ovoid.							
	III.C.1.a.	III.C.2.b.	III.C.2.e.				
Group IV Lenticular.							
	IV.C.1.a.	IV.C.2.b.	IV.C.2.e.				
Group V Plano-convex.							
	V.C.1.a.	V.C.2.b.	V.C.2.e.				
Group VI Semicircular.							
	VI.C.1.a.	VI.C.2.b.	VI.C.2.e.				
Group VII Circle and Flat.							
	VII.C.1.a.	VII.C.2.b.	VII.C.2.e.				
Small beads belonging to groups II-III can, when the deviation from the circular section is not excessive be conveniently grouped with group I and called Spheroids.				Group XV Polyangular.			
				XV.C.1.a.	XV.C.2.b.	XV.C.2.e.	
				Group XVI Tabular.			
				XVI.C.1.a.	XVI.C.2.b.	XVI.C.2.e.	



		1. Convex.									
		Oblate Disc.	Barrel Disc.	Convex Cone Disc.	Convex Truncated Cone Disc.	Convex Bicone Disc.	Convex Truncated Bicone Disc.	Pear-shape Disc.	Cylinder Disc.	Cone Disc.	Truncated Cone Disc.
DISC BEADS.	Longitudinal Section.	A.1.a.	A.1.b.	A.1.c.	A.1.d.	A.1.e.	A.1.f.	A.1.g.	A.2.b.	A.2.c.	A.2.d.
	Group I Circular.										
Length less than $\frac{1}{3}$ diameter	Group IX Square.	I.A.1.a.	I.A.1.b.	I.A.1.c.	I.A.1.d.	I.A.1.e.	I.A.1.f.	I.A.1.g.	I.A.2.b.	I.A.2.c.	I.A.2.d.
		IX.A.1.a.	IX.A.1.b.	IX.A.1.c.	IX.A.1.d.	IX.A.1.e.	IX.A.1.f.	IX.A.1.g.	IX.A.2.b.	IX.A.2.c.	IX.A.2.d.
SHORT BEADS.	Longitudinal Section.	B.1.a.	Short Barrel.	Short Convex Cone.	Short Truncated Convex Cone.	Short Convex Bicone.	Short Truncated Convex Bicone.	Short Pear-shape.	Short Cylinder.	Short Cone.	Short Truncated Cone.
	Group I Circular.										
Length more than $\frac{1}{3}$ and less than $\frac{1}{2}$ diameter.	Group IX Square.	I.B.1.a.	I.B.1.b.	I.B.1.c.	I.B.1.d.	I.B.1.e.	I.B.1.f.	I.B.1.g.	I.B.2.b.	I.B.2.c.	I.B.2.d.
		IX.B.1.a.	IX.B.1.b.	IX.B.1.c.	IX.B.1.d.	IX.B.1.e.	IX.B.1.f.	IX.B.1.g.	IX.B.2.b.	IX.B.2.c.	IX.B.2.d.

3. Concave.										4. Convex and Straight.		5. Straight and Concave.	
Bicone Disc.	Truncated Bicone Disc.	Chamfered Cylinder Disc.	Double Chamfered Cylinder Disc.	Concave Disc.	Concave Cone Disc.	Concave Truncated Cone Disc.	Concave Bicone Disc.	Concave Truncated Bicone Disc.	Cylinder Disc with one Convex End.	Cylinder Disc with two Convex Ends.	Cylinder Disc with one Concave End.	Cylinder Disc with two Concave Ends.	
A.2.e.	A.2.f.	A.2.b.d.	A.2.b.f.	A.3.b.	A.3.c.	A.3.d.	A.3.e.	A.3.f.	A.4.d.b.	A.4.f.b.	A.5.b.d.	A.5.b.f.	
I.A.2.e.	I.A.2.f.	I.A.2.b.d.	I.A.2.b.f.	I.A.3.b.	I.A.3.c.	I.A.3.d.	I.A.3.e.	I.A.3.f.	I.A.4.d.b.	I.A.4.f.b.	I.A.5.b.d.	I.A.5.b.f.	
IX.A.2.e.	IX.A.2.f.	IX.A.2.b.d.	IX.A.2.b.f.	IX.A.3.b.	IX.A.3.c.	IX.A.3.d.	IX.A.3.e.	IX.A.3.f.	IX.A.4.d.b.	IX.A.4.f.b.	IX.A.5.b.d.	IX.A.5.b.f.	
Short Bicone.	Short Truncated Bicone.	Short Chamfered Cylinder.	Short Double Chamfered Cylinder.	Short Concave.	Short Concave Cone.	Short Truncated Concave Cone.	Short Concave Bicone.	Short Concave Truncated Bicone.	Short Cylinder with one Convex End.	Short Cylinder with two Convex Ends.	Short Cylinder with one Concave End.	Short Cylinder with two Concave Ends.	
B.2.e.	B.2.f.	B.2.b.d.	B.2.b.f.	B.3.b.	B.3.c.	B.3.d.	B.3.e.	B.3.f.	B.4.d.b.	B.4.f.b.	B.5.b.d.	B.5.b.f.	
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IX.B.2.e.	IX.B.2.f.	IX.B.2.b.d.	IX.B.2.b.f.	IX.B.3.b.	IX.B.3.c.	IX.B.3.d.	IX.B.3.e.	IX.B.3.f.	IX.B.4.d.b.	IX.B.4.f.b.	IX.B.5.b.d.	IX.B.5.b.f.	

		Longitudinal Section.									
		Circular.	Standard Barrel.	Standard Convex Cone.	Standard Truncated Convex Cone.	Standard Convex Bicone.	Standard Truncated Convex Bicone.	Standard Pear-shape.	Standard Cylinder.	Standard Cone.	Standard Truncated Cone.
STANDARD BEADS.	Group I Circular.	C.1.a.	C.1.b.	C.1.c.	C.1.d.	C.1.e.	C.1.f.	C.1.g.	C.2.b.	C.2.c.	C.2.d.
Length more than $\frac{1}{2}$ and less than $\frac{1}{2}$ diameter.	Group IX Square.	I.C.1.a.	I.C.1.b.	I.C.1.c.	I.C.1.d.	I.C.1.e.	I.C.1.f.	I.C.1.g.	I.C.2.b.	I.C.2.c.	I.C.2.d.
LONG BEADS.	Group I Circular.	D.1.a.	D.1.b.	D.1.c.	D.1.d.	D.1.e.	D.1.f.	D.1.g.	D.2.b.	D.2.c.	D.2.d.
Length more than $\frac{1}{2}$ diameter.	Group IX Square.	I.D.1.a.	I.D.1.b.	I.D.1.c.	I.D.1.d.	I.D.1.e.	I.D.1.f.	I.D.1.g.	I.D.2.b.	I.D.2.c.	I.D.2.d.
Ellipsoid.	Longitudinal Section.										
D.1.a.	D.1.b.	D.1.c.	D.1.d.	D.1.e.	D.1.f.	D.1.g.	D.2.b.	D.2.c.	D.2.d.		
I.D.1.a.	I.D.1.b.	I.D.1.c.	I.D.1.d.	I.D.1.e.	I.D.1.f.	I.D.1.g.	I.D.2.b.	I.D.2.c.	I.D.2.d.		
IX.D.1.a.	IX.D.1.b.	IX.D.1.c.	IX.D.1.d.	IX.D.1.e.	IX.D.1.f.	IX.D.1.g.	IX.D.2.b.	IX.D.2.c.	IX.D.2.d.		

Standard Bicone.	Standard Truncated Bicone.	Standard Chamfered Cylinder.	Standard Double Chamfered Cylinder.	Standard Concave.	Standard Concave Cone.	Standard Truncated Concave Cone.	Standard Concave Bicone.	Standard Truncated Concave Bicone.	Standard Cylinder with one Convex End.	Standard Cylinder with two Convex Ends.	Standard Cylinder with one Concave End.	Standard Cylinder with two Concave Ends.
C.2.e.	C.2.f.	C.2.b.d.	C.2.b.f.	C.3.b.	C.3.c.	C.3.d.	C.3.e.	C.3.f.	C.4.d.b.	C.4.f.b.	C.5.b.d.	C.5.b.f.
I.C.2.e.	I.C.2.f.	I.C.2.b.d.	I.C.2.b.f.	I.C.3.b.	I.C.3.c.	I.C.3.d.	I.C.3.e.	I.C.3.f.	I.C.4.d.b.	I.C.4.f.b.	I.C.5.b.d.	I.C.5.b.f.
IX.C.2.e.	IX.C.2.f.	IX.C.2.b.d.	IX.C.2.b.f.	IX.C.3.b.	IX.C.3.c.	IX.C.3.d.	IX.C.3.e.	IX.C.3.f.	IX.C.4.d.b.	IX.C.4.f.b.	IX.C.5.b.d.	IX.C.5.b.f.
Long Bicone.	Long Truncated Bicone.	Long Chamfered Cylinder.	Long Double Chamfered Cylinder.	Long Concave.	Long Concave Cone.	Long Truncated Concave Cone.	Long Concave Bicone.	Long Truncated Concave Bicone.	Long Cylinder with one Convex End.	Long Cylinder with two Convex Ends.	Long Cylinder with one Concave End.	Long Cylinder with two Concave Ends.
D.2.e.	D.2.f.	D.2.b.d.	D.2.b.f.	D.3.b.	D.3.c.	D.3.d.	D.3.e.	D.3.f.	D.4.d.b.	D.4.f.b.	D.5.b.d.	D.5.b.f.
I.D.2.e.	I.D.2.f.	I.D.2.b.d.	I.D.2.b.f.	I.D.3.b.	I.D.3.c.	I.D.3.d.	I.D.3.e.	I.D.3.f.	I.D.4.d.b.	I.D.4.f.b.	I.D.5.b.d.	I.D.5.b.f.
IX.D.2.e.	IX.D.2.f.	IX.D.2.b.d.	IX.D.2.b.f.	IX.D.3.b.	IX.D.3.c.	IX.D.3.d.	IX.D.3.e.	IX.D.3.f.	IX.D.4.d.b.	IX.D.4.f.b.	IX.D.5.b.d.	IX.D.5.b.f.



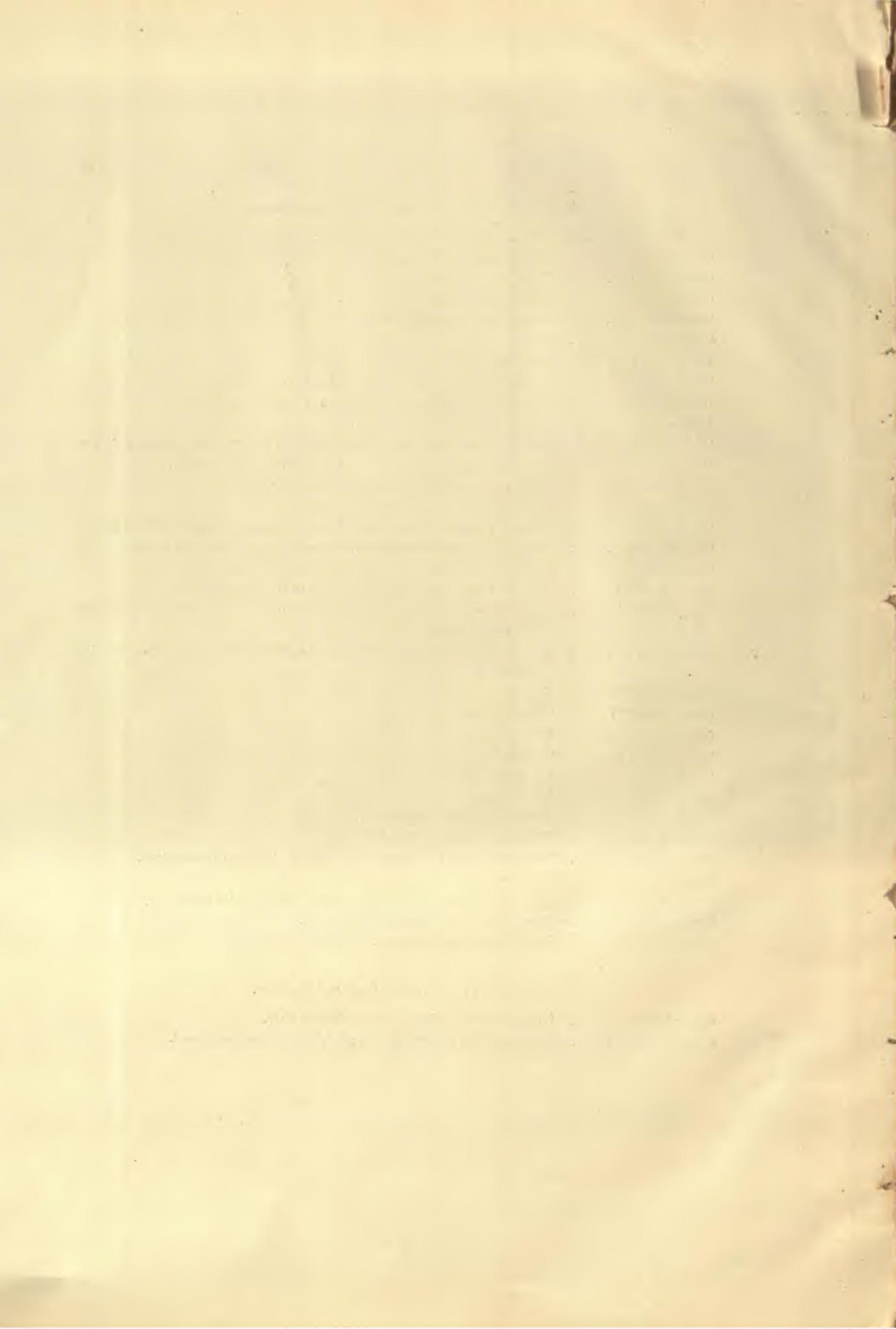
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This Division is divided into thirty-two groups as follows:—

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- Group XVIII . . . Spiral beads and pendants.
- Group XIX . . . Special faceted beads.
- Group XX . . . Annular and wheel pendants.
- Group XXI . . . Bullae.
- Group XXII . . . Simple pendants.
- Group XXIII . . . Notched and gadrooned beads and pendants.
- Group XXIV . . . Filigree and lattice-work beads and pendants.
- Group XXV . . . Granulated beads and pendants.
- Group XXVI . . . Beads and pendants representing or made of flowers, fruits, seeds, or leaves.
- Group XXVII . . . Beads and pendants representing or made of complete shells.
- Group XXVIII . . . Beads and pendants representing weapons or tools.
- Group XXIX . . . Beads and pendants representing emblems.
- Group XXX . . . Beads and pendants representing human beings or human-headed deities.
- Group XXXI . . . Beads and pendants representing or made of parts of human beings.
- Group XXXII . . . Beads and pendants representing animals or animal-headed deities.
- Group XXXIII . . . Beads and pendants representing birds or bird-headed deities.
- Group XXXIV . . . Beads and pendants representing reptiles, insects, etc., or deities with heads of reptiles, insects, etc.
- Group XXXV . . . Beads and pendants representing or made of parts of animals, birds, reptiles, insects, etc.
- Group XXXVI . . . Scarabs.
- Group XXXVII . . . Cylinder seals.
- Group XXXVIII . . . Ball seals.
- Group XXXIX . . . Cone seals.
- Group XL . . . Lenticular seals.
- Group XLI . . . Button seals.
- Group XLII . . . Button beads and toggle beads.
- Group XLIII . . . Elaborate mediaeval carved beads.
- Group XLIV . . . Elaborate jewelled pendants of the Middle Ages and Renaissance.
- Group XLV . . . Netsukes.
- Group XLVI . . . Spot beads and eye beads and pendants with circular eyes.
- Group XLVII . . . Zone, striped, wave, and chevron beads.
- Group XLVIII . . . Sundry beads and pendants.

Division IV.—Irregular Beads and Pendants.

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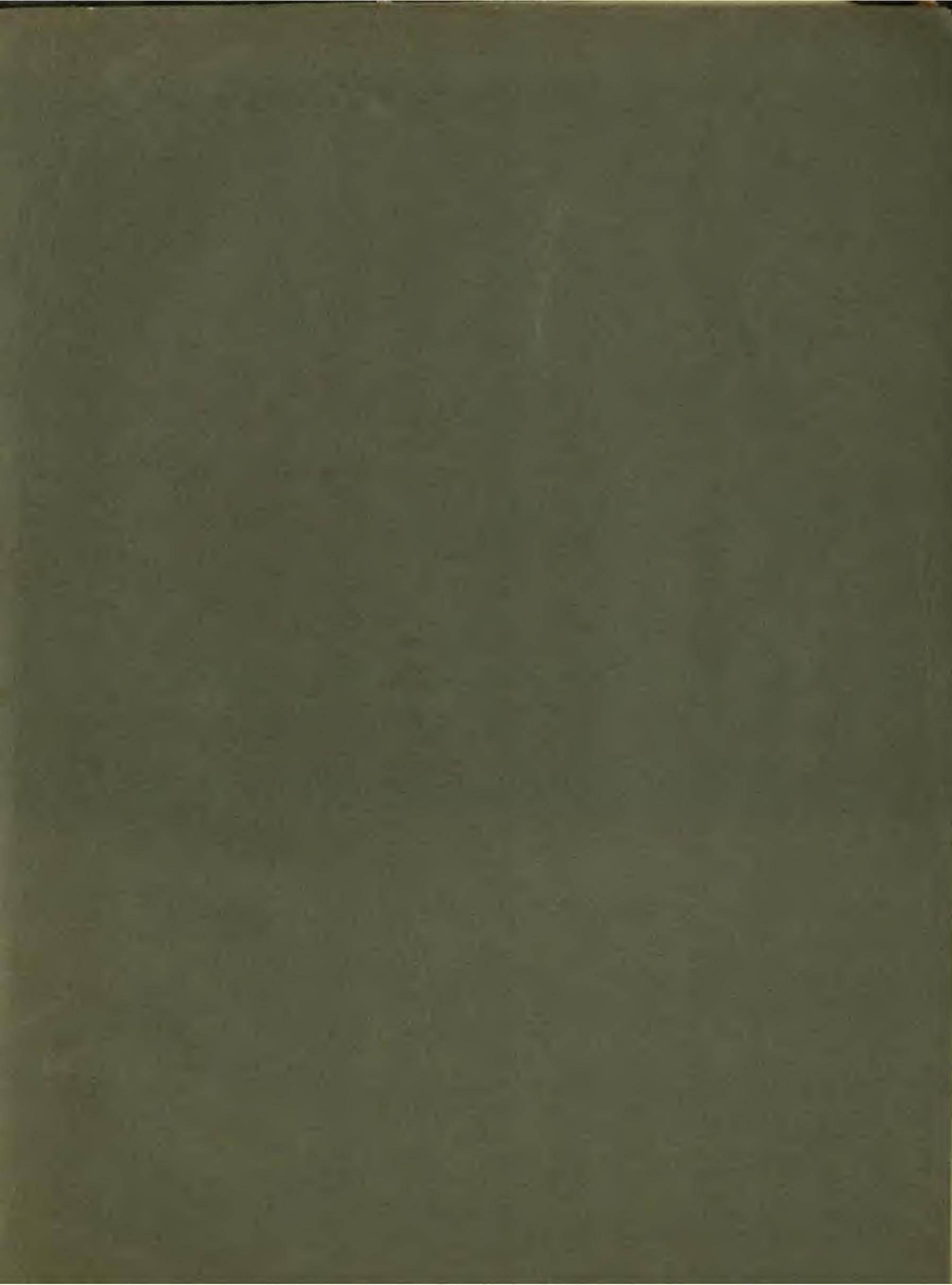
TRADE CONNECTION BETWEEN EUROPE AND ASIA 1.

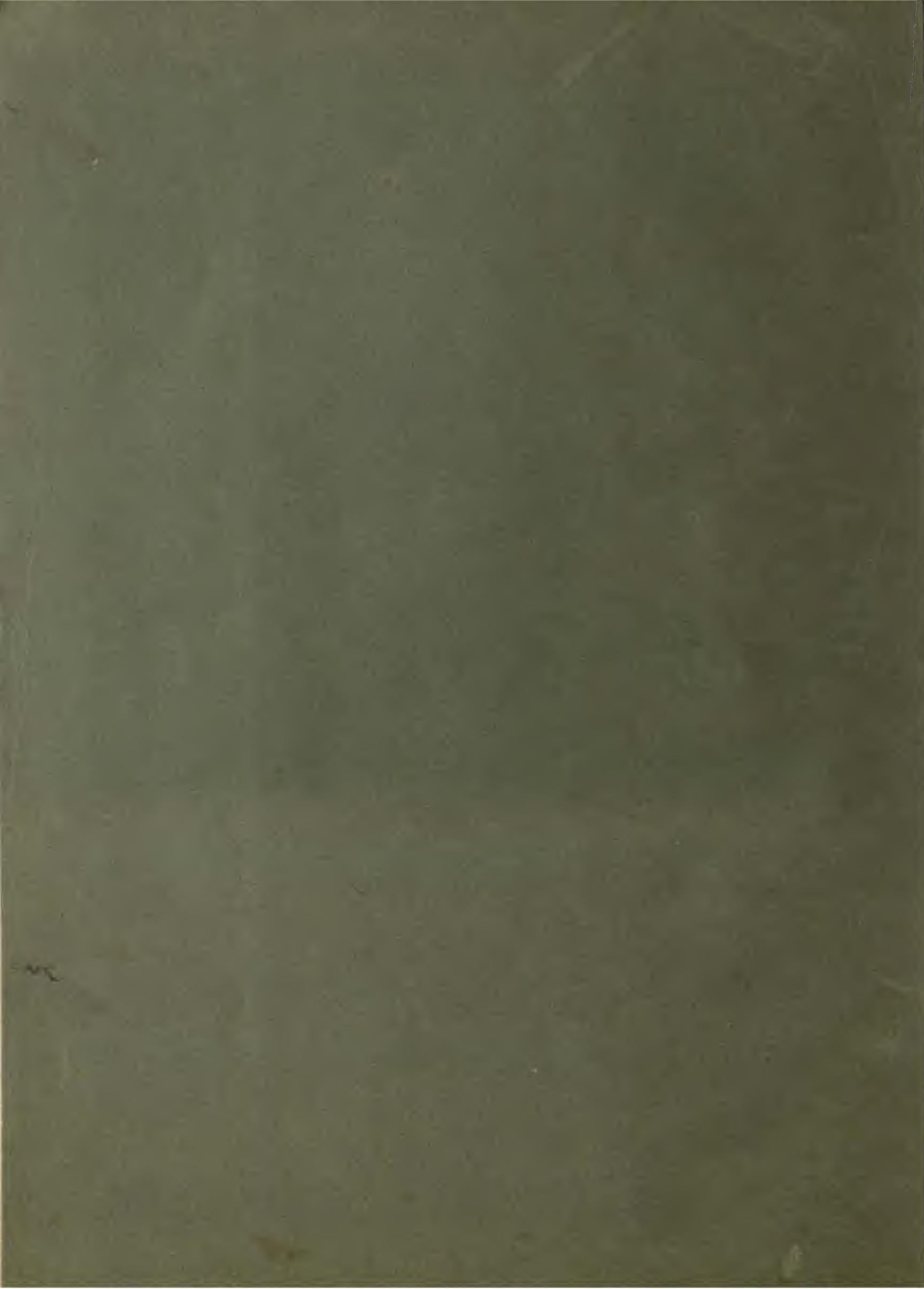
UR 3, 15.

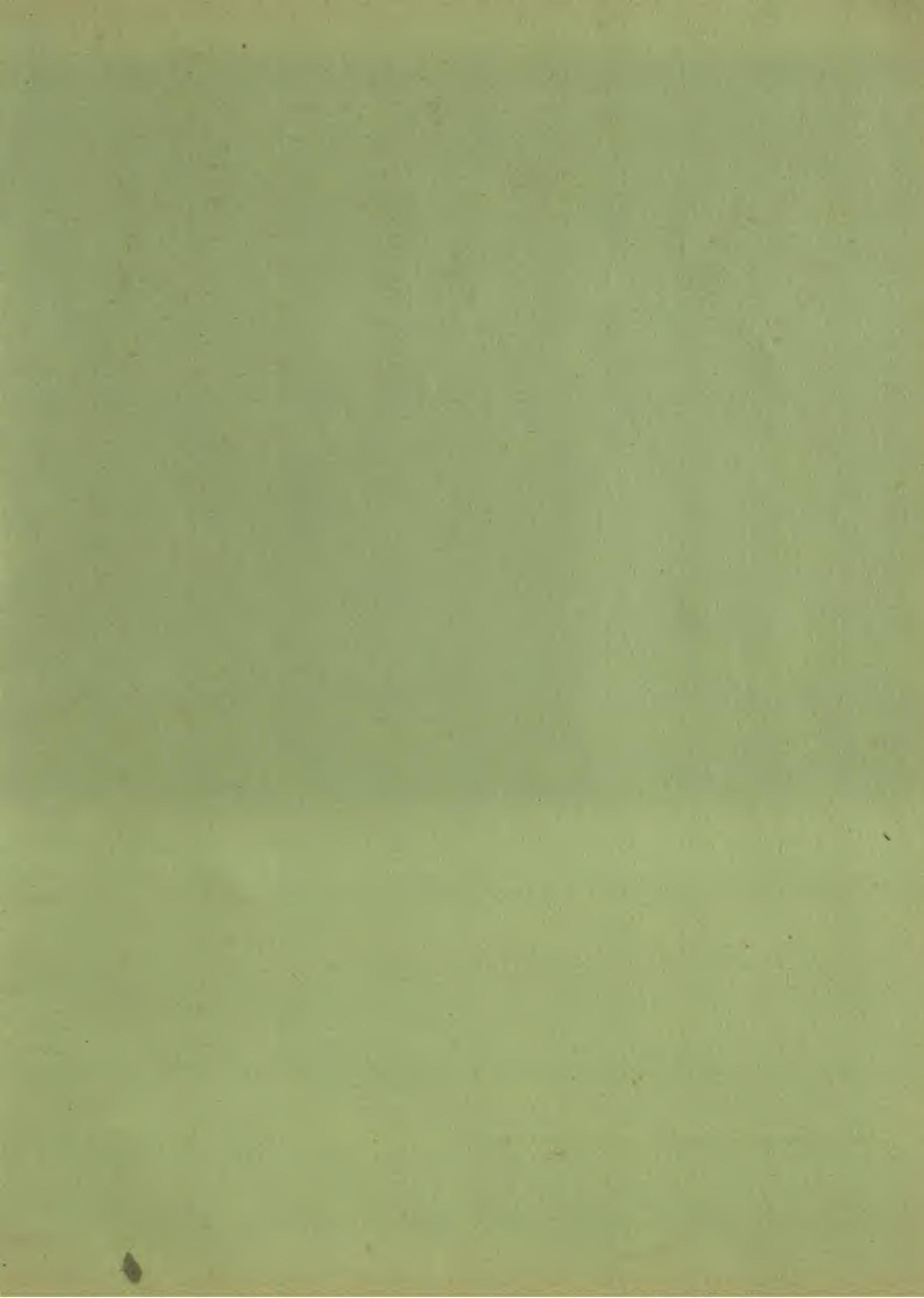
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